Vol. 989 Number 2

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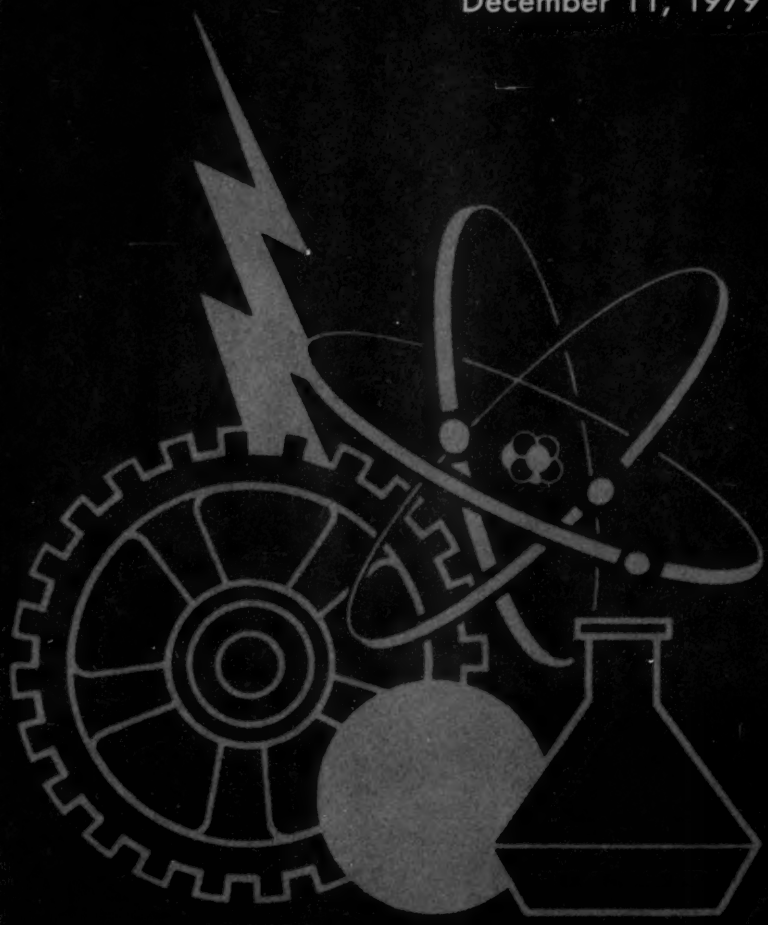
PATENTS

December 11, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 11, 1979 Volume 989 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Department of the Treasury
United States Customs Service

(TMK-2-R:E:E)

NOTICE OF APPLICATION FOR RECORDATION OF TRADE NAME

XYLOGICS, INC.

Application has been filed pursuant to section 133.12 Customs Regulations (10 CFR 133.12), for recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124) of the trade name XYLOGICS, INC. used by Xylogics, Inc., a corporation organized under the laws of the State of Massachusetts, located at 42 Third Avenue, Burlington, Massachusetts 01803.

The application states that the trade name is applied to electronic data processing equipment, including central processing units, memory devices, controllers, interfaces and tape drives, disc drives, terminals and other peripheral input and output equipment; and computer programs in printed form and in the form of magnetic tapes, magnetic discs and read-only semiconductor memories manufactured in England and the United States. Zylogics International, Ltd., Lyton House, Mill Lane, Gerrards Cross, Bucks SL98AY, Great Britain is authorized to use the trade name.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received not later than 30 days from the date of publication of this notice in the Federal Register.

Notice of the action taken on the application for recordation of the trade name will be published in the FEDERAL REGISTER.

Dated: Nov. 5, 1979.

DONALD W. LEWIS,
Director, Office of Regulations and Rulings.

Erratum

In the notice of Reissue Applications Filed which appears in the Official Gazette September 18, 1979, the entry for Patent No. 4,094,801 on page 18 in the Patent Section, 986 OG 18, and on page 14 in the Trademark Section, 986 TMOG 14, is incorrect and should read as follows:

4,094,801. Re. S.N. 048,418. Filed June 14, 1979. Cl. 252/33; MAGNESIUM-CONTAINING COMPLEXES, METHOD FOR THEIR PREPARATION, AND COMPOSITIONS CONTAINING THE SAME, John Wesley Forsberg, Owner of Record: *The Lubrizol Corporation, Wickliffe, Ohio.* Attorney or Agent: James W. Adams, Jr. et al., Ex. Gp.: 116.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,083, Re. S.N. 063,356, Filed Aug. 3, 1979, Cl. 239/224, ATOMIZER WHEEL FOR THE ATOMIZATION OF SUSPENSIONS OF HARD-WEARING MATERIALS, Kaj Nielsen, Owner of Record: *Aktieselskabet Niro Atomizer, Soborg, Denmark,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 313

Re. 29,498, Re. S.N. 073,485, Filed Sep. 7, 1979, Cl. 435/14, PROCESS FOR THE ENZYMATIC DETERMINATION OF GLUCOSE WITH A GLUCOSE-OXYDAZED PEROXIDAZED ENZYME SYSTEM, Franco Meiattini, Owner of Record: *Instituto Sieroterapico E Vaccinogeno Toscano SCLA.VO S.P.A., Siena, Italy,* Attorney or Agent: George B. Finnegan Jr., et al., Ex. Gp.: 172

3,268,351, Re. S.N. 066,887, Filed Aug. 16, 1979, Cl. 427/444, XEROGRAPHIC FIXING METHOD AND APPARATUS, Warren G. Van Dorn, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 162

3,291,466, Re. S.N. 066,885, Filed Aug. 16, 1979, Cl. 432/60, XEROGRAPHIC FIXING DEVICE, Gilbert A. Aser, et al., Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 344

3,341,101, Re. S.N. 065,682, Filed Aug. 10, 1979, Cl. 227/8, POWER-ACTUATED TOOL, David F. Butler, et al., Owner of Record: *Olin Mathieson Chemical Corporation, New Haven, Conn.,* Attorney or Agent: Paul J. Lerner, et al., Ex. Gp.: 322

3,720,979, Re. S.N. 070,869, Filed Aug. 29, 1979, Cl. 16/150, BIASED HINGES, Alois A. Krawagna, Owner of Record: *Westhem Corporation Limited, Toronto, Ontario, Canada,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 353

3,745,792, Re. S.N. 066,882, Filed Aug. 16, 1979, Cl. 66/85 A, WICKING APPARATUS, Raghulinga R. Thettu, Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 353

3,839,444, Re. S.N. 075,367, Filed Sep. 14, 1979, Cl. 260/55 AR, HALOPHENOXY BENZAMIDE HERBICIDES, Robert J. Theissen, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 117

3,845,833, Re. S.N. 072,380, Filed Sep. 4, 1979, Cl. 280/218, TRACTOR SUSPENSION, William A. Bice, Owner of Record: *Clark Equipment Company, Buchanan, Mich.,* Attorney or Agent: Kenneth C. Witt, Ex. Gp.: 316

3,906,916, Re. S.N. 072,501, Filed Sep. 4, 1979, Cl. 123/139 AP, FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES, Helmut Laufer, Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

3,907,135, Re. S.N. 050,525, Filed Jun. 21, 1979, Cl. 414/528, APPARATUS FOR PLANTING SUGAR CANE RELATING TO THE ORIENTATION OF ELONGATED ELEMENTS, Peter Populin, et al., Owner of Record: *Peter Populin and Louis Populin, Home Hill, North Queensland, Australia,* Attorney or Agent: John C. Holman, et al., Ex. Gp.: 314

3,942,624, Re. S.N. 074,574, Filed Sep. 17, 1979, Cl. 198/502, CANTILEVERED BELTED BAG LOADING APPARATUS, Vytautas Kupcikevicius, Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: Michael O. Warnecke, et al., Ex. Gp.: 313

3,996,006, Re. S.N. 044,403, Filed Jun. 1, 1979, Cl. 422/50, SPECIMEN TEST SLIDE, Joseph F. Pagano, Owner of Record: *Smithkline Corporation, Philadelphia, Pa.,* Attorney or Agent: Marcus B. Finnegan, et al., Ex. Gp.: 177

4,012,343, Re. S.N. 072,728, Filed Sep. 4, 1979, Cl. 260/28.5, CROSSLINKED OLEFIN POLYMER HAVING IMPROVED FLAME RETARDANCE, Charles F. Raley, Jr., Owner of Record: *The Dow Chemical Company, Midland, Mich.,* Attorney or Agent: R. G. Waterman, et al., Ex. Gp.: 141

4,013,023, Re. S.N. 066,701, Filed Aug. 15, 1979, Cl. 110/8 A, INCINERATION METHOD AND SYSTEM, Luis A. Lombana, et al., Owner of Record: *Envirotech Corporation, Menlo Park, Calif.,* Attorney or Agent: John J. Morrisey, et al., Ex. Gp.: 344

4,037,961, Re. S.N. 045,420, Filed Jun. 4, 1979, Cl. 356/318, SYSTEM AND APPARATUS FOR CONTOUR PLOTTING THE TOTAL LUMINESCENCE SPECTRUM OF A SAMPLE, James H. Macemon, Owner of Record: *Baxter Travenol Lab., Deerfield, Ill.,* Attorney or Agent: Henry W. Collins, Ex. Gp.: 257

4,046,418, Re. S.N. 072,641, Filed Sep. 5, 1979, Cl. 297/118, WHEELCHAIRS, Royal Smith, et al., Owner of Record: *Inventors,* Attorney or Agent: Rupert J. Brady, et al., Ex. Gp.: 355

4,046,690, Re. S.N. 073,031, Filed Sep. 6, 1979, Cl. 210/75, FILTERING COAL-DERIVED OIL THROUGH A FILTER MEDIA PRECOATED WITH PARTICLES PARTIALLY SOLUBILIZED BY SAID OIL, Billy R. Rodgers, et al., Owner of Record: *U.S. Energy Research and Development Administration, Washington, D.C.,* Attorney or Agent: Allen H. Uzzell, et al., Ex. Gp.: 176

4,046,739, Re. S.N. 073,628, Filed Sep. 10, 1979, Cl. 528/272, PROCESS FOR REDUCING THE PROCESSING TIME IN THE PRODUCTION OF POLYESTERS, Joseph Lacona, Owner of Record: *Koppers Company, Inc., Pittsburgh, Pa.,* Attorney or Agent: Donald M. Mackay, et al., Ex. Gp.: 144

4,047,187, Re. S.N. 072,666, Filed Sep. 5, 1979, Cl. 354/23 D, SYSTEM FOR EXPOSURE MEASUREMENT AND/OR FOCUS DETECTION BY MEANS OF IMAGE SENSER, Yukio Mashimo, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David Loren, et al., Ex. Gp.: 211

4,051,912, Re. S.N. 049,968, Filed Jun. 19, 1979, Cl. 175/410, PERCUSSION DRILL BIT, Kenneth M. White, Owner of Record: *Inventor,* Attorney or Agent: John E. Lind, Ex. Gp.: 354

4,073,269, Re. S.N. 075,066, Filed Sep. 12, 1979, Cl. 123/32 EE, FUEL INJECTION SYSTEM, Herro Herth, et al., Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

4,080,840, Re. S.N. 072,061, Filed Sep. 4, 1979, Cl. 74/61, VIBRATOR DEVICE, Spencer A. Stone, Owner of Record: *The Deister Concentrator Co., Inc., Fort Wayne, Ind.,* Attorney or Agent: George A. Gust, et al., Ex. Gp.: 352

4,087,203, Re. S.N. 062,851, Filed Aug. 1, 1979, Cl. 416/141, CROSS BEAM ROTOR, Donald L. Ferris, et al., Owner of Record: *United Technologies Corporation, Hartford, Conn.,* Attorney or Agent: Vernon F. Hauschild, Ex. Gp.: 343

4,105,603, Re. S.N. 071,559, Filed Aug. 31, 1979, Cl. 260/8, PEPTIDES WHICH EFFECT RELEASE OF HORMONES, Wylie W. Vale, Jr., et al., Owner of Record: *The Salk Institute for Biological Studies, San Diego, Calif.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 143

4,107,307, Re. S.N. 064,672, Filed Aug. 8, 1979, Cl. 424/249, IMIDAZO (1,5-D)-AS-TRIAZINE-4(3H)-ONES AND THIONES, Rolf Paul, et al., Owner of Record: *American Cyanamid Company, Stamford, Conn.,* Attorney or Agent: Edward A. Conroy, Jr., Ex. Gp.: 125

4,116,316, Re. S.N. 064,225, Filed Aug. 6, 1979, Cl. 192/58 A, FLUID COUPLING DEVICE AND BIMETAL COIL, Kenneth R. Streeter, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Robert J. McCloskey, et al., Ex. Gp.: 352

4,118,619, Re. S.N. 071,334, Filed Aug. 30, 1979, Cl. 219/121 L, ROTARY BEAM CHOPPER AND SCANNING SYSTEM, Colin Shaw McArthur, et al., Owner of Record: *R. J. Reynolds Tobacco Company, Winston Salem, N.C.,* Attorney or Agent: Grover M. Myers, et al., Ex. Gp.: 213

4,127,632, Re. S.N. 074,414, Filed Sep. 11, 1979, Cl. 264/334, METHOD OF PRODUCING UNDERCUT TUBULAR PLASTIC ARTICLES, Anton Anger, Owner of Record: *Anton Anger Maschinenbau GmbH, Linz, Austria,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 147

4,129,575, Re. S.N. 068,011, Filed Aug. 20, 1979, Cl. 260/343.21, 8-METHOXYPSORALEN, Louis J. Glunz, et al., Owner of Record: *Thomas C. Elder, Inc., Hamilton, Ind.,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 121

4,129,576, Re. S.N. 068,012, Filed Aug. 20, 1979, Cl. 260/343.21, PROCESS FOR MAKING OMEGA-CHLORO-2,3,4-TRIHYDROXYACETOPHENONE, Louis J. Glunz, et al., Owner of Record: *Thomas C. Elder, Inc., Hamilton, Ind.,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 121

4,131,815, Re. S.N. 063,976, Filed Aug. 6, 1979, Cl. 310/323, SOLID PIEZOELECTRIC SAND DETECTION PROBES, Paul A. Boatright, Owner of Record: *Oceanography International Corporation, College Station, Tex.,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 212

4,138,352, Re. S.N. 068,293, Filed Aug. 20, 1979, Cl. 252/135, DETERGENT COMPOSITIONS WITH ANTISOIL AND ANTIREDEPOSITION PROPERTIES, Arthur S. Teot, et al., Owner of Record: *The Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 166

4,145,084, Re. S.N. 067,838, Filed Aug. 20, 1979, Cl. 297/418, MINIATURE WICKER FURNITURE AND METHOD OF ASSEMBLING SAME, Joan M. Capper, Owner of Record: *Inventor,* Attorney or Agent: Robert B. Kennedy, Ex. Gp.: 355

4,150,897, Re. S.N. 076,092, Filed Sep. 17, 1979, Cl. 356/152, WHEEL MOUNTED VEHICLE WHEEL ALIGNER, Thomas E. Roberts Jr., et al., Owner of Record: *FMC Corporation, San Jose, Calif.,* Attorney or Agent: Robert S. Kelly, Ex. Gp.: 257

PATENT NOTICES

Certificates of Correction for the Week of Dec. 11, 1979

3,870,112	4,129,377	4,154,710	4,164,370
3,926,891	4,129,509	4,155,133	4,164,510
4,014,825	4,131,499	4,156,379	4,164,666
4,024,742	4,131,550	4,157,399	4,164,765
4,026,848	4,132,498	4,157,581	4,165,149
4,037,049	4,133,465	4,157,694	4,165,378
4,055,733	4,135,179	4,157,778	4,165,391
4,062,864	4,137,215	4,157,975	4,165,790
4,064,160	4,137,809	4,157,984	4,165,888
4,073,141	4,137,922	4,158,150	4,166,721
4,081,458	4,139,372	4,158,195	4,166,796
4,083,151	4,139,491	4,158,828	4,167,066
4,084,230	4,139,847	4,158,844	4,167,291
4,086,230	4,140,470	4,159,339	4,167,614
4,094,816	4,140,473	4,159,354	4,167,653
4,097,062	4,140,830	4,159,395	4,167,681
4,103,002	4,140,918	4,159,399	4,167,724
4,107,897	4,141,739	4,159,682	4,167,977
4,109,316	4,142,251	4,159,933	4,168,410
4,109,885	4,142,264	4,161,030	4,168,566
4,109,934	4,144,560	4,161,577	4,168,665
4,110,045	4,145,599	4,161,598	4,168,697
4,111,836	4,146,910	4,161,953	4,168,723
4,112,425	4,147,851	4,162,003	4,168,776
4,114,588	4,148,215	4,162,229	4,169,050
4,115,232	4,148,364	4,163,067	4,169,137
4,115,589	4,149,232	4,163,069	4,169,287
4,116,922	4,149,911	4,163,079	4,169,738
4,117,230	4,150,062	4,163,108	4,169,758
4,118,765	4,151,499	4,163,280	4,169,776
4,122,281	4,152,552	4,163,317	4,169,928
4,122,643	4,152,922	4,163,739	4,169,941
4,123,387	4,153,354	4,163,842	4,169,942
4,128,308	4,154,131	4,164,304	4,170,261

Disclaimers

3,801,857.—*David Warren Luz,* Indianapolis, Ind. TELEVISION DEFLECTION CIRCUIT WITH TRANSFORMERLESS COUPLING BETWEEN THE DRIVER AND OUTPUT STAGE. Patent dated Apr. 2, 1974. Disclaimer filed Oct. 12, 1979, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1–3 of said patent.

4,016,369.—*Thomas Josef Pedersen,* Lincroft, N.J. ADDRESSING ARRANGEMENTS FOR COMMUNICATIONS NETWORKS. Patent dated Apr. 5, 1977. Disclaimer filed Oct. 10, 1979, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claim 1 of said patent.

4,161,634.—*Jules A. Bellisio,* Wall Township, Monmouth County, N.J. COUNT-DOWN ADDRESSING SYSTEM. Patent dated July 17, 1979. Disclaimer filed Oct. 9, 1979, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1–5 of said patent.

4,162,259.—*Welf von Daehne, Rungsted Kyst,* and *Poul R. Rasmussen,* Frederikssund, Denmark. FUSIDIC ACID DERIVATIVES. Patent dated July 24, 1979. Disclaimer filed Oct. 15, 1979, by the assignee, *Leo Pharmaceutical Products Ltd.*

The term of this patent subsequent to July 11, 1995, is hereby disclaimed.

4,164,755.—*Yasushi Matsumoto,* Narashino, Japan. VIDEO DISC APPARATUS. Patent dated Aug. 14, 1979. Disclaimer filed Oct. 12, 1979, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 6, 7, 8, 9 and 12 of said patent.

Erratum

In the notice of Certificates of Correction appearing in 986 OG 30, dated Sept. 25, 1979, Patent No. 3,822,716 should be corrected to read—3,882,716—.

Set XII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between April 1, 1979 and June 30, 1979. All of these addenda have been consolidated into Set XII of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class
2	83	177	252	343
5	85	178	254	346
8	90	179	258	350
9	92	181	260	351
10	98	182	264	352
12	99	184	266	353
15	100	186	267	354
16	104	188	269	355
19	106	192	271	356
23	108	193	272	358
24	110	194	274	360
28	112	196	279	361
29	114	198	280	362
30	116	201	291	364
32	118	202	297	365
33	119	203	302	366
34	122	204	307	401
35	125	206	310	403
37	126	208	312	406
43	128	209	313	407
44	133	210	315	408
46	134	219	318	409
47	137	221	320	414
48	138	222	322	415
49	139	223	323	417
51	140	226	324	422
52	141	231	325	423
53	142	233	328	424
55	144	235	329	425
56	148	239	330	426
60	149	241	331	427
62	156	242	332	428
65	160	243	333	432
69	164	244	334	585
72	165	246	335	
73	173	248	336	
74	174	249	337	
76	175	250	339	
82	176	251	340	

The following newly established classes issued between April and June, 1979: Classes 406, 409, and 585.

ALFRED C. MARMOR,
Administrator for Documentation,
October 22, 1979.

July–September 1979 Classification Orders

The reclassifications covered by the following classification changes became effective between July and September 1979.

Classification Order 692, effective July 17, 1979:

	Class	*Subclasses*
Abolished	195	All.
Established	(New) 435	1–317; Cross-reference art collections: 800–820; 822–948.

Classification Order 693, effective July 19, 1979:			
Established		220	902.
Classification Order 694, effective July 20, 1979:			
Abolished		289	18.
Established		289	16.5; 18.1.
Classification Order 695, effective July 20, 1979:			
Abolished		423	21.
Established		423	21.1; 21.5.
Classification Order 696, effective August 6, 1979:			
Abolished		180	1; 115; 3-6; 25-35; 42-52; 64; 66; 67; 82; 91-114; unnumbered subclass following subclass 90.
		280	11.11.
Established		180	89.2; 164-313; Cross-reference art collections; 900-903.
		280	11.115.
Position change		180	90.6.
Title changes		180	9.44; 153; 79.3.
Classification Order 697, effective August 8, 1979:			
Abolished		260	823-901.
		526	1-58.
		528	11; 46; 47; 130-136; 177; 178; 197; 213; 221; 231; 273; 311; 333; 334; 404.
Established	(New)	525	1-6; 10-324; 326-540. Cross-reference art collections: 901-941.
Classification Order 698, effective August 16, 1979:			
Abolished		544	58.
Established		544	58.1; 58.2; 58.4-58.7.
Classification Order 699, effective August 16, 1979:			
Abolished		126	270; 271.
Established		126	415-452; Cross-reference art collections: 900; 901.
Classification Order 700, effective August 23, 1979:			
Abolished		264	210; 288-290.
Established		264	210.1-210.8; 235.6; 235.8; 288.4; 288.8; 289.3; 289.6; 290.2; 290.5; 290.7.
Classification Order 701, effective August 31, 1979:			
Abolished		260	327-329; 329.2; 329.3; 330.5; 331; 332; 332.1-332.3; 332.5; 332.8.
Established		260	330; 330.3.
	(New)	549	1-90.
Classification Order 702, effective September 24, 1979:			
Abolished		260	208-308.
Established		260	245.1-245.7.
		548	100-269.
Title changes		548	301; 310-312; 314; 319-322; 329; 330; 333; 337; 339; 341; 351; 352; 365; 367; 372; 375-378.
Classification Order 703, effective September 26, 1979:			
Abolished		340	1-15; 15.5; 16-18; 558-560.
Established		340	850-861.
	(New)	367	1-191; Cross-reference art collections: 900-912.
Title change (if applicable).		340	566.

ALFRED C. MARMOR,
Administrator for Documentation,
October 22, 1979.

Patents Available for Licensing or Sale

3,711,837. HEADLINE COUNTING AND PRINTING DESIGN DEVICE. C. Claborne Carter, Suite 513, Nashville City Bank Bldg., Nashville, Tenn. 37201.

4,143,761. SAFETY MATCH BOOK. Francis P. Brand, 11 Curley St., Long Beach, N.Y. 11561.

Application for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

4,156,225. ELECTRIC FUSE WITH INDICATING MEANS.

4,158,911. METHOD OF MANUFACTURING A VACUUM-TYPE CIRCUIT INTERRUPTER.

Application for license under these patents may be addressed to: Patent Counsel, Ordnance Systems Department, General Electric Company, 100 Plastics Ave., Pittsfield, Mass. 01201.

4,036,344. MULTIPLE-PLATE CLUTCH.

4,079,687. TORPEDO TARGET ACQUISITION.

4,169,391. VARIABLE SPEED TRANSMISSION. Abram Schonberger. Correspondence to: Mr. Hugo V. Goodyear, 221 Alder Way, Brandon, Fla. 33511.

4,042,325. METHOD OF KILLING MICROORGANISMS IN THE INSIDE OF A CONTAINER UTILIZING A PLASMA INITIATED BY A FOCUSED LASER BEAM AND SUSTAINED BY AN ELECTROMAGNETIC FIELD. Eli Lilly and Company, 307 East McCarty St., Indianapolis, Ind. 46206.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,123,566. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

4,142,576. HEAT PUMP SYSTEM WITH IMPROVED HEAT TRANSFER.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,166,918. METHOD OF REMOVING THE EFFECTS OF ELECTRICAL SHORTS AND SHUNTS CREATED DURING THE FABRICATION PROCESS OF A SOLAR CELL.

4,166,919. AMORPHOUS SILICON SOLAR CELL ALLOWING INFRARED TRANSMISSION.

4,166,964. INVERTING BUFFER CIRCUIT.

4,166,965. THRESHOLD GATE.

4,167,015. CERMET LAYER FOR AMORPHOUS SILICON SOLAR CELLS.

4,167,020. SUPPRESSION OF LUMINANCE SIGNAL CONTAMINATION OF CHROMINANCE SIGNALS IN A VIDEO SIGNAL PROCESSING SYSTEM.

4,167,021. SUPPRESSION OF CHROMINANCE SIGNAL CONTAMINATION OF THE LUMINANCE SIGNAL IN A VIDEO SIGNAL PROCESSING SYSTEM.

4,167,022. SETUP CONTROL UNIT FOR TELEVISION CAMERAS.

4,167,023. ROTATING HEAD RECORDER WITH DIFFERENT RECORDING AND PLAYBACK SPEEDS.

4,167,025. AUTOMATIC PEAK BEAM CURRENT LIMITER.

4,167,681. MICROWAVE POWER LIMITER COMPRISING A DUAL-GATE FET.

4,167,690. CATHODE AND METHOD OF OPERATING THE SAME.

4,167,744. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING OPTICAL FIBER WINDOW.

4,167,749. NOISE REDUCTION APPARATUS.

4,168,256. PVC MOLDING COMPOSITION.

4,168,330. METHOD OF DEPOSITING A SILICON OXIDE LAYER.

4,168,432. METHOD OF TESTING RADIATION HARDNESS OF A SEMICONDUCTOR DEVICE.

4,168,476. AC VOLTAGE REGULATOR.

4,168,506. FILM GUIDE FOR OPTICAL SCANNERS.

4,168,628. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM HAVING TIME-VARIED EFFECTIVE APERTURE.

4,169,241. OVERVOLTAGE PROTECTED DE-BOOST REGULATOR.

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4,163,677. SCHOTTKY BARRIER AMORPHOUS SILICON SOLAR CELL WITH THIN DOPED REGION ADJACENT METAL SCHOTTKY BARRIER.

4,163,926. SWITCHING REGULATOR FOR A TELEVISION APPARATUS.

4,163,961. ROTARY JOINT.

4,163,974. ANTENNA FEED SYSTEM.

4,164,681. IMAGE DISPLAY DEVICE WITH ION FEEDBACK CONTROL AND METHOD OF OPERATING THE SAME.

4,164,687. TELEVISION KINESCOPE PROTECTION CIRCUIT.

4,164,711. TUNING SYSTEM INCLUDING A MEMORY FOR STORING TUNING INFORMATION WITH USER CONTROLS ARRANGED TO FACILITATE ITS PROGRAMMING.

4,164,739. REDUCTION OF TARGET SHIFT IN COORDINATE CONVERTER.

4,164,755. VIDEO DISC PICKUP APPARATUS.

4,164,756. DISC RECORD GROOVE SKIPPER.

4,164,782. LOCKING MECHANISM FOR RECORD PACKAGE.

4,165,227. STEM-SEALING METHOD FOR ASSEMBLING ELECTRON TUBES INCLUDING IMPROVED CULLET COLLECTION.

4,165,396. METHOD FOR SALVAGING THE LIGHT-ABSORBING MATRIX AND SUPPORT OF A LUMINESCENT SCREEN.

4,165,459. TIME INTERVAL MEASUREMENT.

4,165,560. METHOD FOR MANUFACTURING A DIAMOND STYLUS FOR VIDEO DISC PLAYERS.

4,166,233. PHOSPHOR SCREEN FOR FLAT PANEL COLOR DISPLAY.

4,166,281. VIDEO IMAGE HIGHLIGHT SUPPRESSION CIRCUIT WITH DELAYED COMPENSATION.

Applications for licenses should be addressed to: Division Patent Counsel Space Division General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

4,139,024. THERMAL INSULATION STRUCTURE.

4,150,568. APPARATUS AND METHOD FOR DOWN HOLE VIBRATION SPECTRUM ANALYSIS.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,155,349. A VARIABLE INTENSITY WHISTLE.

Applications for license may be addressed to the Manager-Technology Marketing Operation General Electric Company, 120 Erie Blvd., Schenectady, N.Y. 12305.

3,410,553. ORTHOPEDIC SUPPORTIVE FRAME.

3,813,316. MICROORGANISMS HAVING MULTIPLE COMPATIBLE DEGRADATIVE ENERGY-GENERATING PLASMIDS AND PREPARATION THEREOF.

3,923,603. DISCRETE PLASMID CONSTRUCTION FROM CHROMOSOMAL GENES IN PSEUDOMONAS.

3,928,220. PREPARATION OF HYDROCARBON-DISPERSIBLE MAGNETIC MICROSPHEROIDS IN POWDERED FORM.

3,959,720. VOLTAGE CONTROL SYSTEM FOR HIGH FREQUENCY LINK CYCLOCONVERTER.

4,004,881. APPARATUS FOR GENERATING CARRIER GAS-TEST SPECIMEN VAPOR MIXTURES FOR DELIVERY INTO A GAS CHROMATOGRAPH.

4,011,378. AROMATIZED POLYACETYLENES.

4,020,265. POLYACETYLENE TETRAPOLYMERS.

4,024,046. METHOD FOR MAKING POLYIMIDE COATED CONDUCTORAS IN A CONTINUOUS MANNER AND PRODUCTS MADE THEREBY.

Kulite Semiconductor Products, Inc. offers to grant nonexclusive licenses on reasonable terms and conditions under the following patents.

Inquiries respecting licenses under these patents should be addressed to: Arthur L. Plevy, Patent Counsel, P.O. Box 38, 281 Summerhill Road, East Brunswick, N.J. 08816.

3,654,579. ELECTROMECHANICAL TRANSDUCERS AND HOUSINGS.

3,706,953. PARTICLE IMPACT PROTECTORS AND ASSEMBLIES THEREOF FOR PRESSURE SENSING TRANSDUCERS HAVING DIAPHRAGMS.

3,748,571. PRESSURE SENSITIVE TRANSDUCERS EMPLOYING CAPACITIVE AND RESISTIVE VARIATIONS.

3,753,196. TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS.

3,800,264. HIGH TEMPERATURE TRANSDUCERS AND HOUSING INCLUDING FABRICATION METHODS.

3,739,315. SEMICONDUCTOR TRANSDUCERS HAVING H SHAPED CROSS-SECTIONAL CONFIGURATIONS.

3,819,431. METHOD OF MAKING TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS.

3,868,719. THIN RIBBON-LIKE GLASS BACKED TRANSDUCERS.

3,873,956. INTEGRATED TRANSDUCER ASSEMBLIES.

3,900,811. ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME.

3,924,322. ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME.

3,930,412. ELECTRICALLY SCANNED PRESSURE TRANSDUCER CONFIGURATIONS.

3,930,823. HIGH TEMPERATURE TRANSDUCERS AND HOUSING INCLUDING FABRICATION METHODS.

3,935,634. METHODS OF FABRICATING INTEGRATED TRANSDUCER ASSEMBLIES.

3,951,707. METHOD FOR FABRICATING GLASS-BACKED TRANSDUCERS AND GLASS-BACKED STRUCTURES.

3,970,982. BEAM TYPE TRANSDUCERS EMPLOYING ACCURATE, INTEGRAL FORCE LIMITING.

3,993,150. ECONOMICAL WEIGHING APPARATUS EMPLOYING A CANTILEVER BEAM STRUCTURE.

3,995,247. TRANSDUCERS EMPLOYING GAP-BRIDGING SHIM MEMBERS.

4,016,644. METHODS OF FABRICATING LOW PRESSURE SILICON TRANSDUCERS.

4,025,942. LOW PRESSURE TRANSDUCERS EMPLOYING LARGE SILICON DIAPHRAGMS HAVING NON-CRITICAL ELECTRICAL PROPERTIES.

4,040,172. METHOD OF MANUFACTURING INTEGRAL TRANSDUCER ASSEMBLIES EMPLOYING BUILT-IN PRESSURE LIMITING.

4,041,289. DIGITAL SCALE OR WEIGHING APPARATUS.

4,051,451. BEAM TYPE TRANSDUCERS EMPLOYING DUAL DIRECTION FORCE LIMITING MEANS.

4,115,767. APPARATUS FOR CONVERTING AN ANALOG SIGNAL INTO DIGITAL FORM PARTICULARLY ADAPTED FOR USE IN DIGITAL COUNTER DISPLAYS.

National Technical Information Service

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DOUGLAS P. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6-008,720. Pod Assembly. Filed Feb. 2, 1979.

Patent application 6-015,092. Seawater Battery. Filed Feb. 26, 1979.

Patent application 6-015,269. LCD Controller. Filed Feb. 26, 1979.

Patent application 6-015,828. Sonobuoy Launcher System. Filed Feb. 28, 1979.

Patent application 6–020,902. Synthesized Sinusoid Generator. Filed Mar. 16, 1979.

Patent application 6–024,827. Flexible Piezoelectric Composite Transducers. Filed Mar. 28, 1979.

Patent application 6–030,187. Method and Apparatus for Fabricating a Wideband Whip Antenna. Filed Apr. 16, 1979.

Patent application 6–036,911. Printed Circuit Waveguide to Microstrip Transition. Filed May 7, 1979.

Patent application 6–038,379. Programmable D.C. Motor Servo System. Filed May 11, 1979.

Patent application 6–039,920. Air-Curtain Incinerator for Energetic Materials. Filed May 17, 1979.

Patent application 6–040,251. Adaptive Detector. Filed May 18, 1979.

Patent application 6–042,165. Ion Drag Pumped Heat Pipe. Filed May 26, 1979.

Patent application 6–047,187. Differential Sample and Hold Circuit. Filed June 8, 1979.

Patent application 6–047,459. Acceleration Cueing Simulation Device. Filed June 11, 1979.

Patent application 6–049,693. Stray Light Eliminator in a Scatterometer. Filed June 7, 1979.

Patent application 6–050,946. Charge Coupled Device Signal Output Summing Circuit. Filed June 21, 1979.

Patent application 6–052,298. Wideband Polarization-Transforming Electromagnetic Mirror. Filed June 26, 1979.

Patent application 6–052,368. Protective Communications Helmet. Filed June 27, 1979.

Patent application 6–052,649. Liquid Crystal Fiber Optics Large Screen Display Panel. Filed June 27, 1979.

Patent application 6–054,078. Rat-Race Mixer With Improved Intermediate Frequency Extractor. Filed July 2, 1979.

Patent application 6–055,100. Magneto-Optic Bias of Ring Laser. Filed July 5, 1979.

Patent application 6–056,655. Excimer-Pumped Four Level Blue-Green Solid State Laser. Filed July 11, 1979.

Patent 4,144,534. Battlefield IFF System. Filed May 1, 1975. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,147,929. Optical Photoemissive Detector and Photomultiplier. Filed Aug. 31, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,147,942. Fast Recovery One-Shot. Filed July 1, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,151,893. Wing in Ground Effect Vehicle. Filed Sept. 8, 1977. Patented May 1, 1979. Not available NTIS.

Patent 4,153,962. Undersea Tether/Termination Assembly. Filed Dec. 27, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,155,653. Smoke-Measuring Transducer. Filed Oct. 14, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,155,981. Rectangular Cell Honeycomb Chemical Converter-Heat Exchanger. Filed Feb. 9, 1978. Patented May 22, 1979. Not available NTIS.

Patent 4,156,869. Conducting Cable. Filed June 20, 1977. Patented May 29, 1979. Not available NTIS.

Patent 4,157,863. Acousto-Optic Modulator. Filed Apr. 6, 1978. Patented June 12, 1979. Not available NTIS.

Patent 4,157,926. Method of Fabricating a High Electrical Frequency Infrared Detector by Vacuum Deposition. Filed June 22, 1973. Patented June 12, 1979. Not available NTIS.

Patent 4,158,207. Iron-Doped Indium Phosphide Semiconductor Laser. Filed Mar. 27, 1978. Patented June 12, 1979. Not available NTIS.

Patent 4,158,649. Polymeric Membranes Which Contain Polyphenylquinoxalines and Which Are Useful as Battery Separators. Filed Oct. 17, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,158,781. Transmit Receive Solid State Switch for Electroacoustic Transducers. Filed Jan. 30, 1978. Patented June 19, 1979. Not available NTIS.

Patent 4,160,175. Differential Threshold Detector. Filed Jan. 12, 1978. Patented July 3, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 6–041,143. Massively Parallel Processor Computer. Filed May 21, 1979.

Patent application 6–041,164. Buck/Boost Regulator. Filed May 21, 1979.

Patent application 6–051,270. Multiple Band Circularly Polarized Antenna. Filed June 22, 1979.

Patent application 6–051,271. Decommutator Patchboard Verifier. Filed June 22, 1979.

Patent application 6–051,274. Automatic Flowmeter Calibration System. Filed June 22, 1979.

Patent application 6–053,652. Power Converter. Filed June 29, 1979.

Patent 4,154,228. Apparatus and Method of Inserting a Microelectrode in Body Tissue or the Like Using Vibration Means. Filed Aug. 6, 1976. Patented May 15, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6–019,806. Serial Phase Shift Beamformer Using Charge Transfer Devices. Filed Mar. 12, 1979.

Patent application 6–038,761. Propellant Binder Manufacture Without a Transient Volatile Pre-Solution Step. Filed May 14, 1979.

Patent application 6–039,059. Thiols of Solid Propellant Modifiers. Filed May 14, 1979.

Patent application 6–050,578. Thermal Signature Targets. Filed June 21, 1979.

Patent application 725,606. Pyrotechnic Smoke Composition. Filed Sept. 22, 1976.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Alabama	Birmingham Public Library	(205) 254-2555
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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 3, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	2-5-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

REISSUES

DECEMBER 11, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,162

METHOD AND DEVICE FOR TRANSFERRING FRESH BOBBINS FROM A BOBBIN SUPPLY DEVICE TO A CONVEYOR BELT OF A TEXTILE MACHINE

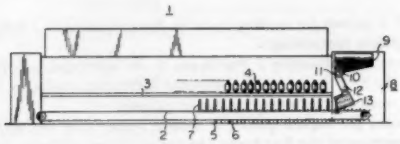
Ikuo Komura, Toyota; Hideo Tamai, Kariya; Takayuki Morita, Obu, and Masanao Kobayakawa, Anjyo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Original No. 3,938,308, dated Feb. 17, 1976, Ser. No. 534,723, Dec. 20, 1974. Application for reissue Apr. 6, 1977, Ser. No. 785,187

Claims priority, application Japan, Dec. 26, 1973, 49-2498[U]

Int. Cl.[2] D01H *9/18*

U.S. Cl. 57—266 **6 Claims**



6. In a textile machine, a method for transferring fresh bobbins from a bobbin supply device to supporting pegs mounted on a conveyor belt, comprising positioning a plurality of substantially parallel fresh bobbins on an incline supporting plane and an additional fresh bobbin on a horizontal supporting plane connected to said inclined supporting plane and formed adjacently above said conveyor belt, resiliently preventing free escape of said fresh bobbin on said horizontal supporting plane from said horizontal supporting plane, moving each of said pegs to a bottom bore of said fresh bobbin along a horizontal passage to said supporting plane, inserting one of said pegs into said bottom bore of said fresh bobbin positioned on said horizontal supporting plane, urging said fresh bobbin toward the outside of said supporting plane by horizontal displacement of said peg, discharging said fresh bobbin from said supporting plane while overcoming said resilient prevention of free escape of said fresh bobbin, and thereafter moving a new fresh bobbin by gravity down said incline supporting plane to said horizontal supporting plane.

Re. 30,163

CARTON

Melvin H. Meyer, Maywood, and Gerald G. Weitzel, Oaklawn, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

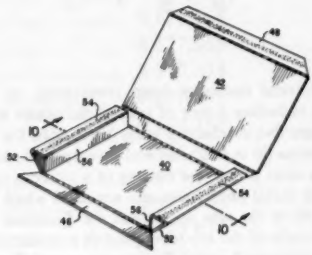
Original No. 3,985,230, dated Oct. 12, 1976, Ser. No. 598,712, Jul. 24, 1975. Application for reissue Apr. 20, 1978, Ser. No. 898,327

Int. Cl.[2] B65D *85/30, 85/54*

U.S. Cl. 206—424 **12 Claims**

12. A cushioned shipping folder formed from a unitary blank of foldable paperboard or the like, comprising:

first and second major parallel walls and first and second minor parallel walls foldably interconnected to form a tubular structure, said first and second major parallel walls being rectangular in shape, said first major wall being [greater] *lesser* in length than said second major wall; a closure and protecting structure for each end of said tubular structure including first and second flaps foldably connected to each other along a straight fold line extending the entire length of said first and second flaps, said first and second flaps being rectangular in shape and coextensive in length with each other and with the width or shorter dimensions of said first major wall, said first flap being foldably connected to said first major parallel wall along a straight fold line extending along the entire width or shorter dimension of said first major wall, [at least a portion of said first flap being folded obliquely with respect to said first major wall, said second flap being folded to a position generally perpendicular to said first major wall, said first flap portion, said second flap and a portion of said first major wall forming a uniformly shaped air cushion extending across the entire width of said first major wall,] said closure and protecting structure further comprising an additional fold line being formed in said first [inner] flap thereby dividing said first [inner] flap



into a first and second section, said first [inner] flap first section being folded obliquely with respect to said first major wall, said first [inner] flap second section being folded to a position in facing relationship with said section major wall, *said second flap being folded to a position generally perpendicular to said first major wall, said first flap first and second sections and said second flap forming a uniformly shaped air cushion extending across the entire width of said first major wall,* the fold line between said first [inner] flap first and second section being engageable with the end edge of said second major wall.

Re. 30,164

EXPOSURE SYSTEM FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Rudolf Eppe, Taufkirchen; Gunther Schnall, Eching; Gunter Abbe, Gilching, and Rudiger Ettelbruck, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Original No. 3,977,781, dated Aug. 31, 1976, Ser. No. 475,150, May 31, 1974. Application for reissue Feb. 17, 1978, Ser. No. 878,745

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1973, 2328463

Int. Cl.[2] G03B *27/32*

U.S. Cl. 355—69 **16 Claims**

1. Apparatus for transferring images of stationary originals onto a light receiving surface, comprising, in combination, means for moving said surface in a predetermined direction along a first path; a stationary holder for said originals, said holder being spaced apart from said path and being arranged to support an original in a position in which one side of said original on said holder faces said path; flash means for illuminating said one side of said original for a predetermined short illuminating interval; a lens element disposed between said holder and said path; and means for moving said lens element in said predetermined direction along a second path parallel to said first path during said short illuminating interval, so that said lens element images all of said one side of that said original onto said light receiving surface.

Re. 30,165

ELECTRIC DISCHARGE LAMP

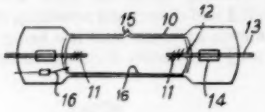
David R. Mason; Susan M. Cole, both of Runcorn; Maurice A. Cayless, and David O. Wharmby, both of London, all of England, assignors to Thorn Lighting Limited, London, England

Original No. 3,900,754, dated Aug. 19, 1975, Ser. No. 434,382, Jan. 18, 1974. Application for reissue Aug. 19, 1977, Ser. No. 826,237

Claims priority, application United Kingdom, Jun. 19, 1973, 2953/73

Int. Cl.[2] H01J *61/30*

U.S. Cl. 313—221 9 Claims



1. An electrical discharge lamp comprising: an arc tube; components including a pair of spaced electrodes in said arc tube and respective conductive leads or supports for said electrodes; a gaseous fill in said tube; and a transparent, defect-free, solution-deposited protective coating of a vitreous compound selected from metal phosphates and arsenates *which is inert to the gaseous fill in the tube* on at least the [internal surface] *surfaces internally* of the arc tube [and th exposed surfaces of said leads or supports] which [tend to react with] *are reactive to* said *gaseous* fill [during operation of the lamp].

Re. 30,166

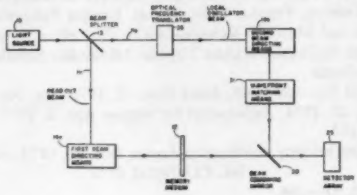
HETERODYNE READOUT HOLOGRAPHIC MEMORY

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 3,698,010, dated Oct. 10, 1972, Ser. No. 181,803, Sep. 20, 1971. Application for reissue Oct. 9, 1974, Ser. No. 513,447

Int. Cl.[2] G11C *11/02;* G03H *1/30, 1/22*

U.S. Cl. 365—122 27 Claims



19. A system for reading out a bit pattern stored in a hologram, the system comprising:

means for directing a first beam to the hologram, a portion of the first beam being diffracted by the hologram to form a reconstructed image of the bit pattern;

means for superimposing a second beam with the diffracted portion of the first beam, the second beam differing from the first beam such that a beat frequency is produced when the first and second beams are superimposed; and

means for detecting a beat frequency signal produced by the superimposed first and second beams for each bit of the bit pattern.

PATENTS

GRANTED DEC. 11, 1979

ERRATA

For CLASS	See PATENT NO.
433–174	4,177,562
433–228	4,177,563
433–082	4,177,564
433–075	4,177,565
024–176	4,177,623
242–217	4,177,655
166–263	4,177,752
137–599	4,177,840
220–270	4,177,929
220–284	4,177,930
220–288	4,177,931
220–307	4,177,932
220–307	4,177,933
220–319	4,177,934
220–417	4,177,935
220–441	4,177,936
222–063	4,177,937
222–080	4,177,938
222–153	4,177,939
222–636	4,177,940
222–636	4,177,941
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430–049	4,178,179
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430–524	4,178,181
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435–126	4,178,213
435–252	4,178,214
548–251	4,178,288
549–022	4,178,290
549–039	4,178,291
585–357	4,178,317
525–077	4,178,318

525–188 4,178,319
525–188 4,178,320
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525–188 4,178,322
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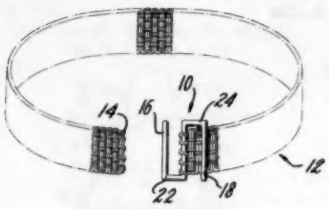
525–188 4,178,324
525–157 4,178,325
525–176 4,178,326
525–169 4,178,327
525–098 4,178,328
525–077 4,178,329
525–003 4,178,330
525–398 4,178,429
178–018 4,178,481
250–338 4,178,522
350–006.6 4,178,561
343–756 4,178,574
343–781 R 4,178,576
367–159 4,178,577
367–139 4,178,578
346–163 4,178,583
346–140 R 4,178,595

PATENTS

GRANTED DECEMBER 11, 1979

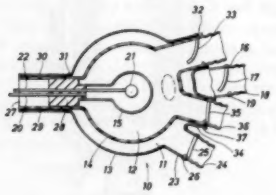
GENERAL AND MECHANICAL

4,177,522
SURVIVAL BELT
Parker K. Auburn, 95 Dwight Pl., Englewood, N.J. 07631
Filed Nov. 25, 1977, Ser. No. 854,889
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—338 **11 Claims**



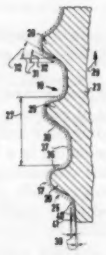
1. A belt, which may be quickly converted into a single length of cord having sufficient strength for supporting the weight of a person, comprising:
a buckle having at least one cross piece;
a web woven from a single length of cord formed into approximately 3–10 loops approximately 2–4 feet long, each loop passing over said cross piece, said loops forming a plurality of warp strands;
the bight of said cord, remaining after formation of said loops, being woven in weft loops through said warp strands as pairs of weft strands, each succeeding weft loop passing through the end of the previous weft loop;
the end of the cord in the last weft loop being passed through the penultimate weft loop and then woven back through the warp to releasably lock the weave;
whereby the end of the cord may be pulled out of the warp and through the penultimate loop to unlock the weave which can then be quickly unwoven by pulling on the cord to convert the belt into a long single length of survival line.

4,177,523
ARTIFICIAL HEART
Arnold J. Landé, 2145 Stanmore Dr., Houston, Tex. 77019
Filed Mar. 15, 1978, Ser. No. 886,824
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **6 Claims**



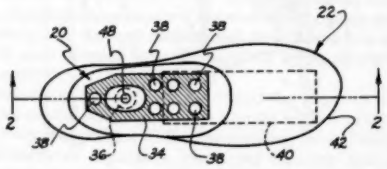
1. A blood pumping apparatus for use as an artificial heart comprising;
(a) a 1st pumping chamber having expandable walls and having an inlet for receiving blood and an outlet for discharging blood;
(b) a 2nd pumping chamber positioned within said 1st pumping chamber having expandable walls and having an inlet for receiving blood and an outlet for discharging blood; and
(c) an inflatable blood displacement means having expandable walls positioned within said 2nd pumping chamber for periodic inflation and deflation to discharge and receive blood in said 2nd pumping chamber and for periodic expansion and contraction of said 2nd pumping chamber walls for discharging and receiving blood in said 1st pumping chamber.

4,177,524
MEDICAL SECUREMENT ELEMENT WITH ABRASIVE GRAINS ON THREAD SURFACE
Helmut Grell, Aalen, and Heinz Scharbach, Plankstadt, both of Fed. Rep. of Germany, assignors to Pfaudler-Werke A.G., Schwetzingen, Fed. Rep. of Germany
Filed May 10, 1977, Ser. No. 795,658
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621384
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.9 **11 Claims**



1. A medical securement element for engagement with a counterthread in a bone, comprising a self-tapping screw thread with biocompatible abrasive grains at the surface of the thread.

4,177,525
REINFORCED ARTIFICIAL FOOT AND METHOD OF MAKING
Charles J. Arbogast, and Robert E. Arbogast, both of Mount Sterling, Ohio, assignors to Ohio Willow Wood Co., Inc., Mount Sterling, Ohio
Filed Nov. 9, 1977, Ser. No. 849,763
Int. Cl.[2] A61F *1/08*
U.S. Cl. 3—7 **15 Claims**



1. An artifical foot comprising, in combination, a rigid keel portion comprising a porous plastic material disposed in the ankle region and having a flat top portion, a relatively flat, downwardly sloping bottom portion integrally formed with a curved instep portion and rounded toe and rear portions, said plastic material being molded in surrounding relationship to a metallic insert securely imbedded within said plastic material and including a vertical extending bolt receiver portion adapted to receive a fastener means and a flat elongate strip

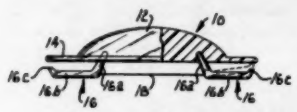
portion joined to said receiver portion, said strip portion disposed in the lower portion of said keel in generally parallel extending relationship to said sloping bottom portion thereof; and a flexible porous, plastic covering molded in surrounding and bonded relationship to said keel portion and having the general configuration of the human foot.

4,177,526

SECURING DEVICE FOR AN INTRAOCULAR LENS

John C. Kuppinger, deceased, late of Harlingen, Tex., and by Charlotte W. Kuppinger, executrix, 1515 N. Ed Carey Dr., Harlingen, Tex. 78550

Filed Jul. 22, 1977, Ser. No. 818,003
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **4 Claims**



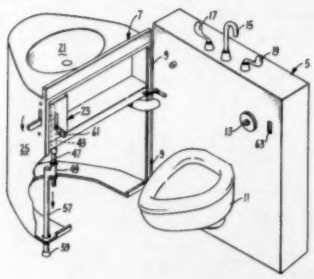
1. An intraocular lens structure comprising:
a lens adapted to be implanted in the pupillary region of the eye adjacent the iris;
a plurality of resilient L-shaped arms on one face of the lens with one end of one leg of each arm anchored in the lens and the other leg extending outwardly toward the periphery of the lens and terminating in a free end; and
a frangible tension member connecting said arms and of a length such that the arms are held in a position such that the free ends are spaced away from the confronting surface of the lens, said frangible member constructed in a manner to be capable of being severed by a laser beam whereby to release the arms to effect pinching of the iris between the lens surface and said free ends.

4,177,527

LATCH ON MASQUERADER UNIT

Richard E. Uhlig, Burlingame, Calif., assignor to Aluminum Plumbing Fixture Corp., South San Francisco, Calif.

Filed Nov. 15, 1978, Ser. No. 960,968
Int. Cl.[2] A47K *4/00*
U.S. Cl. 4—3 **2 Claims**



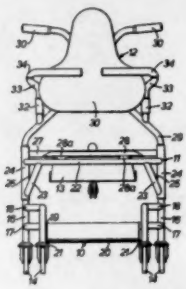
1. In a combination wash basin and toilet fixture wherein the toilet bowl is mounted on a fixed frame and the wash basin is mounted on a swinging frame by means of hinges whereby the wash basin can be swung to a first position flush with the main frame to enable one to use the wash basin and can be swung to a second position away from the main frame to enable one to use the toilet, the improvement comprising a latch mechanism, said latch mechanism having a downwardly extending arm with an operating handle connected thereto and having a spring means to normally bias said arm in a down position whereby upon release of said operating handle, said arm will move downwardly and engage the floor, stabilizing the wash basin in the second position.

4,177,528

SANITARY CHAIRS

David R. James, Covertside, Hasfield, Gloucester, England

Filed Jan. 13, 1976, Ser. No. 648,775
Claims priority, application United Kingdom, Jan. 21, 1975, 2538/75
Int. Cl.[2] A47K *11/04;* B60N *1/06;* B60R *21/10*
U.S. Cl. 4—134 **7 Claims**



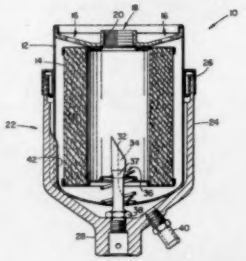
1. A sanitary or commode chair having an apertured seat and two side support arms each of which comprises a main side portion arranged to extend alongside, and an inturned end portion arranged to extend in front of, a person seated in the chair, and means movably mounting the end arm portions on the main side portions for opening movement relative to the side portions of the arms whereby to allow front entry and exit of the user with the side portions in the normal side-support position.

4,177,529

FILTER WRENCH

William J. Sikula, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 18, 1978, Ser. No. 934,901
Int. Cl.[2] B25F *1/00*
U.S. Cl. 7—100 **14 Claims**



1. A filter wrench for draining and removing a fluid filter having an outer canister and an inner filter element from a filter utilizing device, comprising: a housing having a closed bottom and an open top sized to encircle and engage said fluid filter, said housing having gripping means provided on the inside thereof for gripping portions of said outer canister when said housing engages said fluid filter, and said housing having rotating means provided thereon for rotating said housing for removal of said fluid filter; punch means secured to said housing extending from the bottom thereof for puncturing said outer

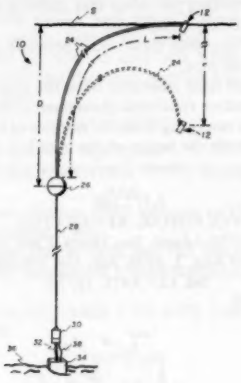
canister when said housing engages said fluid filter, said punch means having outer passage means provided therein for allowing the passage of fluid from said outer canister into said housing; and outlet means provided in said housing at the bottom thereof for allowing the drain of fluid therefrom.

4,177,530

BUOY SYSTEM FOR VERTICAL OCEAN PROFILING

Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1978, Ser. No. 905,712
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **8 Claims**



1. A buoy system for obtaining a vertical profile of oceanic conditions between a predetermined depth d and the ocean surface, said system comprising, in combination:

an instrumentation vehicle that is operable to be cycled between a predetermined negative buoyancy condition and a predetermined positive buoyancy condition;

flexible tether means having a length L in excess of said predetermined depth and being characterized by a predetermined positive buoyancy factor per unit of length, whereby said tether means has a total positive buoyancy that is greater than said predetermined negative buoyancy condition and is distributed along said length of said tether means;

said tether means having one end fixed at depth D approximating said predetermined depth d and having its other end connected to said vehicle, whereby when said vehicle is in said positive buoyancy condition, it will float at said surface and when in said negative buoyancy condition will sink until the negative buoyancy condition is balanced at said predetermined depth d by an equal positive buoyant force imposed by the portion of said tether means being drawn downwardly by said vehicle, at which depth said vehicle will hover until cycled to said positive buoyancy condition for ascent to said surface.

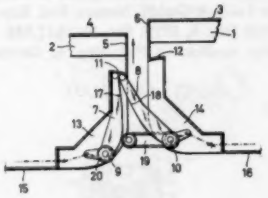
4,177,531

DEVICE FOR ADJUSTING AND COUPLING AMPHIBIOUS VEHICLES

Eberhard Illgner, Nieder-Olm, Fed. Rep. of Germany, assignor to Magirus-Deutz AG, Ulm, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 945,201
Int. Cl.[2] E01D *21/00*
U.S. Cl. 14—27 **7 Claims**

1. An arrangement for adjusting adjacent differently immersed amphibious floating bodies to a common coupling height, which includes: a first amphibious floating body, a second amphibious floating body, each of said floating bodies having at least one wall thereof provided with a supporting arm pivotally connected thereto, and also having an abutment surface adapted to receive therebelow the supporting arm of the pertaining floating body and also the supporting arm of the other floating body to be connected thereto, each supporting arm pertaining to the respective less immersed floating body



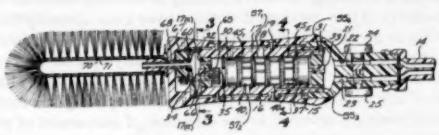
being adapted to be pivoted below the abutment of the respective deeper immersed floating body and to be locked therebelow to thereby lift said deeper immersed floating bodies so as to align the surfaces of said floating bodies while interconnecting said last mentioned floationg bodies.

4,177,532

ROTARY BRUSH

Shinsuke Azuma, 6020 Lindley Ave., Encino, Calif. 91316

Filed Oct. 2, 1978, Ser. No. 947,470
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—24 **3 Claims**



1. A rotary brush device adapted to be attached to a home water outlet comprising:

a hollow substantially tubular handle structure;

a substantially tubular inner casing received on the interior of said handle structure, said casing including a plurality of stand offs formed on the exterior peripheral surface thereof for separating said casing from said handle;

valve means attached to one end of said handle structure and connected to said outlet;

an end cap deployed between said handle structure, said casing and said valve means for defining a first cavity communicating between said casing and said valve means, a second cavity being defined between said casing and said handle structure and a third cylindrical cavity being formed on the interior of said casing, said casing including a plurality of longitudinal bores extending from said first cavity into the wall thereof each terminating in a tangential port directed into said third cavity at selected axial locations;

a plurality of pelton wheels mounted for common rotation on a central shaft and deployed on the interior of said third cavity in alignment with corresponding ones of said ports;

a plurality of separators interposed between said pelton wheels in said third cavity;

a plurality of windows formed in said casing in corresponding alignment with said pelton wheels, said windows communicating between said second and third cavities for permitting the outward escape of fluid from said wheels into said second cavity;

a nozzle closing off the other end of said handle structure and communicating with said second cavity;

a sleeve rotatably mounted on the exterior of said nozzle;

a driven gear attached to said sleeve;

gearing means disposed in said nozzle and engaged between said driven gear and said shaft; and

a brush attachable to said sleeve.

4,177,533
CLEANING DEVICE

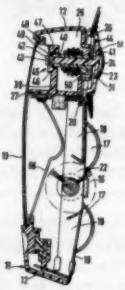
Johannes Liebscher, Nassau, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit International Guenter Leifheit GmbH, Nassau, Fed. Rep. of Germany

Filed Dec. 4, 1975, Ser. No. 637,856

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1974, 2457414

Int. Cl.[2] A47L *11/33*

U.S. Cl. 15—42 **13 Claims**



1. In a cleaning device including a housing adapted for movement in two opposite directions over a one cleaning body having an upwardly directed shaft and a ring of radially downwardly directed bristles; a pair of vertically spaced bearings provided in said housing for rotatably supporting said shaft, one of said bearings defining an elongated opening the major axis of which is oriented in the direction of movement of said housing to permit the pivoting of said shaft about a pivot point defined by the other bearing and thus, in response to a change in the direction of movement of said housing, alternately tilting one of two opposite positions of said ring of bristles into engagement with said surface; and driving means for imparting rotary movement to said shaft in a direction dependent on the direction of movement of said housing.

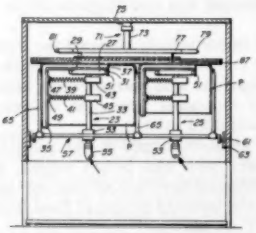
4,177,534
WASHING MACHINE FOR CLEANING COOKING POTS OR SIMILAR ARTICLES

Joseph C. Lanzisera, 43 Jackson Ave., Bayville, Long Island, N.Y. 11709

Continuation-in-part of Ser. No. 675,923, Apr. 12, 1976, Pat. No. 4,069,533. This application Nov. 28, 1977, Ser. No. 855,202

Int. Cl.[2] A46B *13/06*

U.S. Cl. 15—56 **6 Claims**



1. Apparatus for cleaning a cooking pot comprising an upwardly extending washer-scrubber unit for washing and scrubbing the inside surface of said cooking pot, said upwardly extending washer-scrubber unit comprising:

(a) a rotably mounted vertical pipe,

(b) scrubbing means fixedly mounted on said vertical pipe and adapted to support said cooking pot when said cooking pot is placed thereon in an inverted position and contact the inside of said cooking pot,

(c) a first horizontal pipe, having angled end nozzles, fixedly attached to said vertical pipe, the interiors of the two pipes being in communication, said first horizontal pipe being positioned on said vertical pipe so as to be below the cooking pot when the cooking pot is mounted on the scrubbing means,

(d) a second horizontal pipe having spray end nozzles, fixedly attached to said vertical pipe, the interiors of the two pipes being in communication, said second horizontal pipe being positioned on said vertical pipe so as to be inside said cooking pot when said cooking pot is mounted on said scrubbing means, and

(e) means for supplying fluid under pressure to said interior of the vertical pipe,

(f) whereby said fluid emerging from the nozzles of the first pipe will produce rotational movement of the vertical pipe and the fluid emerging from the nozzles of the second pipe will spray wash the inside of the cooking pot.

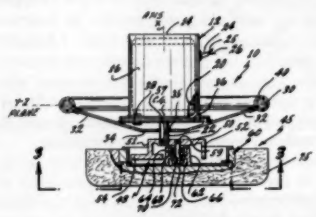
4,177,535
POLISHING APPARATUS

Bernie R. Cole, 2930 Adams, San Diego, Calif. 92116

Filed Aug. 2, 1978, Ser. No. 930,532

Int. Cl.[2] A47L *11/12*

U.S. Cl. 15—97 R **3 Claims**



1. A portable apparatus for polishing and the like comprising:

an electrical motor having a longitudinal axis, said electric motor having a housing, said housing comprising a top wall and sidewalls, said electric motor having a shaft extending from the bottom of said motor housing:

handle grip means secured to said electrical motor housing, said handle grip means being in the form of a steering wheel with at least two spoke arms whose inner ends are secured to said motor housing, said handle grip means being in a horizontal plane substantially perpendicular to the longitudinal axis of said electric motor, the plane in which said handle grip means is located being oriented between a plane drawn parallel to the top wall of said motor housing and a plane drawn parallel to the bottom of the side walls of said motor housing,

the center of gravity of said apparatus being in a plane perpendicular to the longitudinal axis of said electric motor that is below said horizontal plane passing through said handle grip means thereby causing said polishing apparatus to automatically right itself any time a tipping force is removed;

a polishing wheel assembly detachably secured to the lower end of said electric motor shaft, said polishing wheel assembly being oriented to rotate in a plane substantially perpendicular to the longitudinal axis of said electric motor shaft, said polishing wheel assembly an eccentric orbital member and a polishing wheel;

said eccentric orbital member comprising:

an elongated plate having a first threaded bore located perpendicular to the bottom surface of said plate, said first

threaded bore being substantially symmetrically centered on said plate, a pair of legs depend downwardly from the opposite ends of said elongated plate, a foot of substantial mass is formed on the bottom of one of said legs, said foot being formed substantially perpendicular to said leg and being in the shape of a half moon, and a second threaded bore located perpendicular to the top surface of said plate but being located eccentrically with respect to the center of said plate, said motor shaft being threadably received in said second threaded bore;

said polishing wheel having a hub at its center with counter sunk recesses in its opposite lateral sides, a ball bearing assembly is received in the top recess, the center of said hub also has an aperture that connects with the top and bottom recesses, a bolt having a smooth shank portion passes through said aperture with its head being captured in the bottom recess, said smooth shank portion is also journaled within said ball bearing assembly with a threaded tip portion on said bolt being threadably received in said first threaded bore on the bottom of said elongated plate.

4,177,536

KINETIC BRUSH AGITATOR WITH BACK UP BEATER BAR

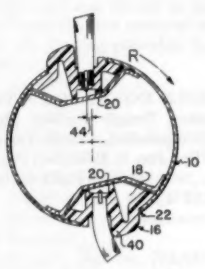
Joseph A. Powers, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Dec. 6, 1978, Ser. No. 966,804

Claims priority, application United Kingdom, May 12, 1978, 19275/78

Int. Cl.[2] **A46B** *7/10;* **A47L** *5/00*

U.S. Cl. 15—182 **2 Claims**



1. A suction cleaner agitator having a generally cylindrical body and a beater bar, disposed closely adjacent to a brush having a free length; said beater bar being disposed so as to provide backup for said brush during cleaning rotation and being shorter than said brush; said beater bar having a curved shoulder facing said brush and adjacent the periphery of said beater bar; said shoulder being located at between one quarter and three quarters of the free length of said brush; said brush bending over said shoulder during agitation; said shoulder having a radius of less than one quarter of the free length of said brush; said brush extending from said agitator body in a trailing relationship, with the centerline of the brush offset from the center of the agitator body in the direction of the beater bar, rearwardly relative to the direction of rotation of the agitator body.

4,177,537

ARM TO BLADE CONNECTOR

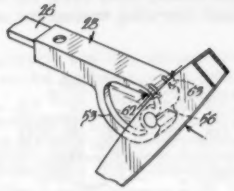
Gary W. Roadarmel, Michigan City, Ind., assignor to The Anderson Company of Indiana, Gary, Ind.

Filed Nov. 27, 1978, Ser. No. 963,988

Int. Cl.[2] **B60S** *1/40*

U.S. Cl. 15—250.32 **10 Claims**

1. A connector for connecting a windshield wiper arm to a blade, said connector having a blade-receiving part, said blade-receiving part having a slot formed therein along an axis transverse to the longitudinal axis of the connector, a latch means formed on said body portion in spaced relation to said body portion, said latch means being urged toward said body portion an amount sufficient to fit the latch means inside the spaced side walls of an opening in said blade, whereby the connector is moved transverse to the longitudinal axis of the



blade until the latch means are disposed between the side walls and the slot in the connector passes over the cross pin to seat the cross pin in said slot, and whereby pivoting the connector about the axis of the cross pin permits the latch means to snap out of the opening in the blade, said latch means engaging the top edges of the opening in the blade whenever the connector is pivoted excessively with respect to the blade.

4,177,538

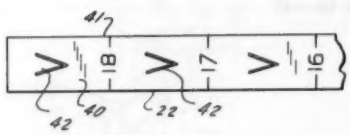
WINDSHIELD WIPER ELEMENT

William M. Blaiklock, Dundas, and Brian A. Fisher, Burlington, both of Canada, assignors to Tridon Limited, Burlington, Canada

Filed Jul. 27, 1978, Ser. No. 928,460

Int. Cl.[2] **B60S** *1/38*

U.S. Cl. 15—250.39 **10 Claims**



8. A windshield wiper element comprising an elongated backing strip having a slot formed therein and a squeegee element having a head received in said slot, said backing strip having a plurality of breakage indications provided thereon at predetermined spaced locations corresponding to predetermined windshield wiper lengths and means on the backing strip located at least between each of said breakage indications for engaging said head strip of the squeegee to resist longitudinal removal of the squeegee from the backing strip; said means comprising a plurality of integral tabs formed in said backing strip and respectively located between each of said indications and depressed into said channel for engagement with said head strip.

4,177,539

OSCILLATING SOOT BLOWER MECHANISM

Larry M. Elting, 712 Madison Ave., Lancaster, Ohio 43130

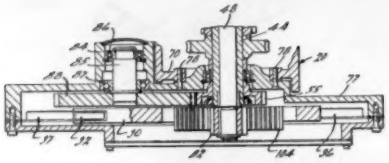
Filed Sep. 26, 1978, Ser. No. 945,854

Int. Cl.[2] **F23J** *3/02*

U.S. Cl. 15—316 R **4 Claims**

1. In a long travel soot blower or the like having a supporting beam, a carriage adapted to travel along the beam and including a housing forming an enclosure for the carriage, a lance secured to the carriage to travel therewith but rotatable about its longitudinal axis, longitudinal rack means carried by the beam, a motor operatively interconnected with the carriage, walking pinion means carried by the carriage and rotatable to drive the carriage and lance along the beam, and transmission means for rotating the walking pinion means and for

oscillating the lance about its longitudinal axis characterized by a pair of interfitted independently rotatable shafts journaled in but projecting at their outer ends outside said housing of the carriage, the radially outer of said shafts being drivable by the motor and having gear means thereon within the carriage housing for driving said walking pinion means to actuate the carriage along the beam, a yoke driving gear on the projecting outer end of said radially outer shaft, the outer end of the radially inner shaft extending beyond the outer end of the



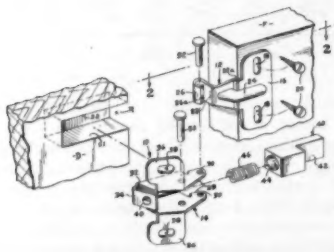
radially outer shaft, an inner end of said radially inner shaft having a rotary driving connection to the lance within the carriage housing, a yoke driven gear on the outer end of the radially inner shaft, an accessory housing secured to the outside of the carriage housing and enclosing said two last-mentioned gears, and yoke means in said accessory housing actuatable by the yoke driving gear for oscillating the yoke driven gear and the radially inner shaft to oscillate the lance about its longitudinal axis.

4,177,540

SELF-CLOSING CONCEALED HINGE

Howard B. Gorton, San Gabriel, Calif., assignor to Ajax Hardware Corporation, City of Industry, Calif.

Filed Feb. 10, 1978, Ser. No. 876,616
Int. Cl.[2] E05D *11/08*; E05F *1/12*
U.S. Cl. 16—142 **8 Claims**



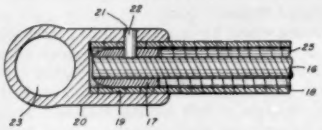
1. A compact hinge assembly comprising door and frame wings mountable on said door and said frame, respectively, one of the wings having a housing including a pair of closely spaced parallel ear plates joined by a connecting bight and adapted to be concealed in a narrow elongate recess in the door, the ear plates having laterally extending securing plates, the other of the wings having a knuckle having an engageable ridge and disposed inbetween the ear plates and an arm connected to the knuckle at one end and having second securing plates at the opposite end, the arm fitting between the ear plates, a hinge pin pivotally interconnecting said knuckle and ear plates for relative swinging of said wings about a fixed axis defined by the axis of said hinge pin, a pressure element disposed in snug sliding relation between the ear plates, spring means biasing the pressure element substantially radially toward said hinge pin in all positions of said wings, and retaining means on the housing and engaging the remote side of the pressure element from the connecting bight to hold the pressure element against the connecting bight, whereby adjacent the closed position of the door the pressure element engages the ridge to urge the door to closed position.

4,177,541

BICYCLE CABLE

Raymond N. Seakan, Randolph, Mass., assignor to Acro-Fab Industries, Inc., Stoughton, Mass.

Filed Jul. 20, 1978, Ser. No. 926,310
Int. Cl.[2] A44B *21/00*; F16G *11/00*
U.S. Cl. 24—73 A **4 Claims**



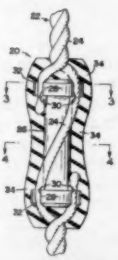
1. In a cable assembly for locking cycles and the like having
an inner flexible steel cable,
an outer steel flexible sheath coaxial with said cable,
in combination, an inner fitting having an outer diameter less than the inner diameter of said sheath, means permanently securing said inner fitting to said cable,
an end fitting having a cylindrical recess shaped and sized to receive an end of said sheath and
a pin extending into and permanently interengaging said sheath and said end and inner fittings.

4,177,542

HANDHOLD INSERT FOR A TWISTED ROPE

James H. Denney, Temple Terrace, Fla., assignor to Vector Engineering Corporation, Temple Terrace, Fla.

Filed Jun. 8, 1978, Ser. No. 913,675
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—115 R **11 Claims**

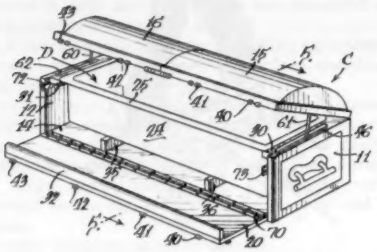


1. A handhold of the type primarily intended for use in combination with a twisted rope, said handhold comprising: a substantially elongate body means comprising a central shaft and oppositely disposed flange means extending radially from each end of said shaft, whereby said central shaft defines a relieved portion of said body means; and a plurality of groove means comprising a plurality of notches formed in each of said flange means and being axially aligned with a corresponding one of said notches in the other of said flange means, the number of said plurality of said groove means being at least equal to the number of strands forming the twisted rope, whereby said handhold may be inserted between the separated strands of the rope such that each strand will seat in at least two of said notches to secure said handhold within the rope.

4,177,543
DISPLAY CASKET

Manfred E. Angermann, Rte. 5, Box 465 Geneva Oaks Rd., Lake Geneva, Wis. 53147

Filed Jun. 26, 1978, Ser. No. 919,232
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—35 9 Claims

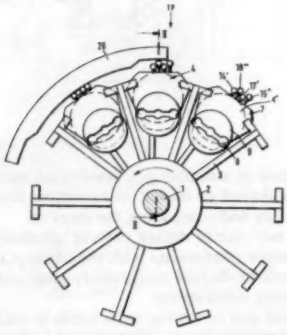


1. A display casket for removably holding a body display container having a continuous lateral flange around its upper periphery comprising, a casing with front, rear and side walls, a bottom and a lid to have the appearance of a conventional casket, each of said walls having an upper surface to engage under said lateral flange for support of the display container, first hinge means with a removable hinge pin pivotally mounting said lid to the rear wall, second hinge means interconnecting said casing and the lower edge of the rear wall for downward pivoting of the rear wall, releasable latch means for holding the rear wall in upright position, and pivot means acting between said front wall and the lid to enable reverse inclination of the lid for insertion and removal of a body display container through an opening provided by downward pivoting of the rear wall.

4,177,544
METHOD OF AND APPARATUS FOR MAKING TAMPONS

Gerd Bischkopf, Kottenheim; Herbert Gawarecki, Haltern-Flaesheim, and Gerhard Cremer, Mayen, all of Fed. Rep. of Germany, assignors to Biloma GmbH Spezialmaschinenfabrik, Mayen, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,632
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607975
Int. Cl.[2] A61F *13/20*
U.S. Cl. 28—119 23 Claims



1. A method of making tampons from a strip of pressable material, said method comprising the steps of:

(a) continuously orbiting a succession of angularly spaced treatment stations about an axis in a predetermined rotational sense, whereby each of said stations trails on a circular path the station immediately downstream and leads the station immediately upstream;

(b) continuously withdrawing said strip of pressable material from a supply and feeding said strip in a direction substantially tangential to said circular path, and during each orbit of said stations:

(c) gripping the end of said strip at a first one of said stations and pulling said strip from said supply as said first station orbits;

(d) thereafter gripping said strip between said end and said supply at a second station immediately trailing said first station;

(e) thereafter severing the gripped strip at said second station and releasing the severed strip portion only at said first station, whereby a new end of said strip is formed at said second station;

(f) thereafter winding said severed portion at said second station up into a tampon blank;

(g) thereafter pressing said tampon blank at said second station into a finished tampon; and

(h) thereafter discharging said finished tampon from said second station.

4,177,545
FASTENING METHOD AND PRODUCT

Martin R. Lambertz, New Hamburg, Canada, assignor to The Stanley Works, Limited, Ontario, Canada

Filed Dec. 28, 1976, Ser. No. 755,057
Claims priority, application Canada, Dec. 30, 1975, 242770
Int. Cl.[2] B21D *53/40;* B21K *13/02;* B23P *11/00;* B21D *39/03*
U.S. Cl. 29—11 6 Claims

1. A method of reducing squeak in a hinge assembly of the type in which a pair of hinge members are pivotally interconnected by a headed rivet passing through axially aligned holes therein comprising:

(a) providing a first hinge member having a noncircular hole therethrough and a second hinge member having a circular hole therethrough;

(b) providing a rivet having (i) a head and a stem portion, said stem portion having a constant external diameter throughout its entire length, (ii) an axial bore through the head and extending into the stem to provide a longitudinal substantially circular tubular portion corresponding in length substantially to the thickness of said first hinge member, and a solid stem portion contiguous with said tubular portion and extending therefrom;

(c) axially aligning said noncircular and said circular holes;

(d) inserting said stem portion through said aligned noncircular and circular holes in said respective hinge members so that the head of said rivet abuts said first hinge member and said solid stem portion projects into said circular hole in said second hinge member; and

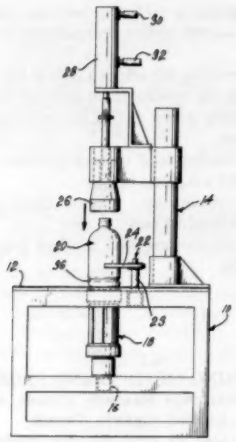
(e) applying a compressive force to the ends of said rivet sufficient only to upset and radially expand said tubular portion to a shape substantially conforming to said noncircular hole, thereby preventing rotational movement of said rivet relative to said first hinge member while permitting movement of said second hinge member relative to said first hinge member and said rivet and thus produce a substantially squeak free hinge assembly.

4,177,546

APPARATUS FOR INSERTING A RESILIENT BAND ON A CONTAINER

Wolfgang Geisinger, 180 rue Paradis, Rosemere, Quebec, Canada

Filed Feb. 23, 1978, Ser. No. 880,639
Claims priority, application Canada, Aug. 22, 1977, 285194
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 **9 Claims**



1. Apparatus for inserting a resilient band on a container adjacent one end thereof, comprising: an outer cylindrical member having a top wall for receiving thereon said band to be inserted, said member having a side wall provided with a series of circumferentially spaced slits extending from said top wall to a location therebeneath on said side wall to define a series of fingers pivotable about their lower portions; plunger means slidably mounted coaxially within said cylindrical member and in contacting engagement with said fingers, said plunger means having a top wall for receiving said one end of said container thereon; said plunger means being actuable to move downwardly within said member to thereby cause outward pivotal movement of said fingers whereby said band on said top wall of said cylindrical member is caused to slide on said container into a predetermined position thereon, said outward pivotal movement of said fingers being such that contact of said fingers with said container is prevented as sais band slides on said container into said predetermined position.

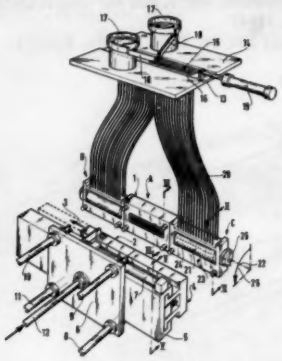
4,177,547

METHOD OF MANUFACTURING CABLE CLIPS AND DEVICE FOR APPLYING THE METHOD

René Aubert, Pont A Mousson, France, assignor to Societe d'Usinage des Tubes pour l'Electricite S.U.T.E., Pont A Mousson, France

Filed Feb. 23, 1978, Ser. No. 880,521
Claims priority, application France, Feb. 25, 1977, 77 05624
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 **23 Claims**

1. A method of automatic manufacture of clips for supporting tubes or electric cables on a surface, said clips having substantially the shape of a hook and being assembled with a fixing member for fixing the clip to the surface; the method comprising successively: at a first station, an injection phase in a mould defined by a fixed half-mould and a movable half-mould; a transfer phase at a second station during which the movable half-mould is transferred, carrying the moulded clips with it; a fixing member insertion phase for said clips at said second station; and an ejection phase of the assembled clips and



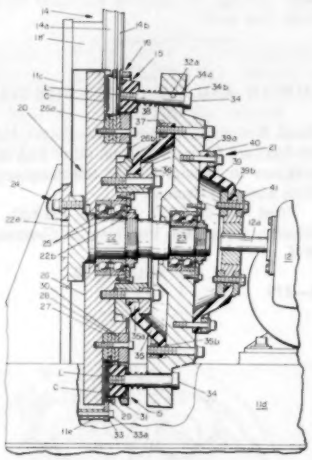
wherein; the cycle of the phases resume after return of the movable half-mould to said first station.

4,177,548

METHOD AND DEVICE FOR ASSEMBLING COAXIALLY INTERFITTING PARTS

Jon R. Yarick, Walbridge, Ohio, and Nelson J. Franks, Lambertville, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 16, 1978, Ser. No. 906,496
Int. Cl.[2] B23P *11/02, 19/02;* **B21D** *51/46*
U.S. Cl. 29—453 **21 Claims**



1. A method of assembling a pre-shaped pair of coaxially mating parts shaped to interfit in assembled relationship one within the other and comprising the steps of:

arranging said pair of mating parts in unassembled positionally oriented relationship with the corresponding interfitting portions thereof respectively disposed in adjacent confronting relationship;

rotating said pair of mating parts while in such positionally oriented relationship in a first arcuate path lying in a plane disposed transversely to the axis of coaxial alignment of said mating parts;

concurrently rotating an axially elongated assembly member in rotational synchronization and in endwise confronting relationship with said mating parts, but in a second arcuate path deployed in adjacent oblique planar relationship with

the plane of said first arcuate path and with the elongate axis of said assembly member positioned transversely to said second orbital path and in endwise alignment with said mating parts; and

correlating the oblique planar relationship and relative interspacing of said first and second arcuate paths to cause said assembly member to uniformly advance and retreat relative to said first arcuate path and during such advance to forcefully urge said mating parts into assembled interfitting relationship with one another.

8. A rotary assembly device for assembling a pre-shaped pair of coaxially mating parts shaped to interfit in assembled relationship one within the other and comprising:

means for carrying said pair of mating parts in unassembled positionally oriented relationship with interfitting portions thereof respectively disposed in adjacent confronting relationship while concurrently rotating said mating parts in a first arcuate path lying in a plane disposed transversely to the axis of coaxial alignment of said mating parts;

an axially elongated assembly member;

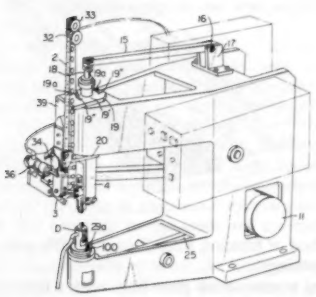
means for carrying said assembly member and concurrently rotating the same in a second arcuate path adjacently interspaced from said first arcuate path and lying in a plane deployed in adjacent oblique planar relationship relative to the plane of said first arcuate path, said last-mentioned means being operative to rotate said assembly member in rotational synchronization with the mating parts carried by the first-mentioned means and being adapted to carry said assembly member with the elongate axis thereof positioned transversely to said second arcuate path and in endwise alignment with said mating parts; and

the oblique planar relationship and interspacing of first and second arcuate paths being correlated to cause said assembly member to uniformly advance and retreat relative to said mating parts and during such advance to forcefully urge said mating parts into assembled interfitting relationship with one another.

4,177,549
MACHINE FOR MOUNTING ELECTRICAL COMPONENTS ONTO PRINTED-CIRCUIT BOARDS

Kazuhiro Mori; Yoshihiko Misawa, and Kiyoshi Mayahara, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,814
Claims priority, application Japan, Mar. 22, 1977, 52-31712
Int. Cl.[2] B23P *23/00;* B23Q *41/02*
U.S. Cl. 29—564.2 **5 Claims**

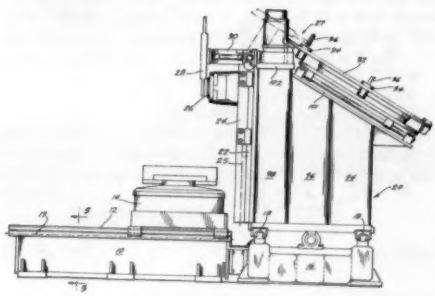


1. Apparatus for inserting the connecting wires of successively arranged electrical circuit component parts on a feeding tape into matching holes of a circuit board, said connecting wires extending in a same direction from said feeder tape, comprising: a mounting bracket rotatable about an axis along which the connecting wires are inserted into said matching holes; means for fixing said bracket in an arbitrary position with respect to said axis; means mounted on said bracket for intermittently advancing said feeder tape; a cutter mounted on said bracket and operable to successively cut off the connecting wires of each of said component parts in response to each intermittent advancement of said feeder tape; an insertion head operable to reciprocate along said axis and rotatable with said mounting bracket to take up said arbitrary position and including a first gripper operable to rotate, during the time when said insertion head is moved downward, from a first position in which the gripper holds the cutoff component part to a second position in which the connecting wires of the held component part are substantially oriented toward said matching holes; and a second gripper disposed below said insertion head and operable to reciprocate along said axis in directions opposite to the directions of movement of said insertion head for holding the connecting wires that extend through the matching holes to give a bend thereto.

4,177,550
MACHINE TOOL WITH HOLLOW STRUCTURAL STEEL MEMBERS

Charles B. Sipek, Hales Corners; Richard Johnstone, Brookfield, and Russell B. Clegg, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 1, 1978, Ser. No. 874,327
Int. Cl.[2] B23B *37/00;* B23C *1/00*
U.S. Cl. 29—568 **6 Claims**



1. In a machine tool having a bed and having a member slidably mounted on said bed for movement along a horizontal axis, the improvement wherein said bed comprises a plurality of structural steel tubes;

all of said tubes being substantially rectangular in cross-sectional shape and extending in a parallel relationship, at least one flat longitudinal face of each of said tubes being in abutment and connected with an adjecent tube,

means connecting the ends of all of said tubes together to form a unitary structure; and,

a pair of ways attached to said tubes for slidably supporting said member.

4,177,551
METHOD OF WELDING A ARC BATTERY INTERCELL CONNECTOR

George S. Johnson, Anderson, and Robey C. Reff, Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1978, Ser. No. 944,257
Int. Cl.[2] H01M *2/24;* B23P *9/16*
U.S. Cl. 29—623.1 **1 Claim**

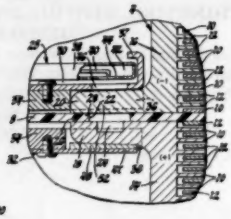
1. The process of assembling a multicell, lead-acid storage battery comprising the steps of:

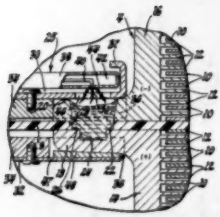
forming a case having a plurality of partitions subdividing the case into a plurality of individual cell compartments, said partitions having apertures therein adapted to receive

battery intercell connectors for electrically series interconnecting the several cells of the battery;

assembling a cell group for each of said compartments, said group comprising a stack of alternating positive and negative plates, a positive plate strap electrically joining the positive plates together, a negative plate strap electrically joining the negative plates together and upstanding lugs on said plate straps, wherein pairs of said lugs are adapted by fusion to electrically join the plate straps of adjacent groups through the apertures in the partitions and wherein one lug member of each lug pair has a substantially flat face on its partition-abutting side and the other lug member of each pair has a cavity formed in its partition-abutting side;

inserting said groups in said cell compartments such that the lugs of each pair overlie said aperture on opposite sides of said partition and so as to have said cavity in substantial axial alignment with said aperture;





orienting said case such that said other lug member lies beneath said one lug member and the partition positioned therebetween;

applying the arc of an inert-gas-shielded, nonconsumable-electrode, arc welding torch to the backside of said one lug member such as to fuse through substantially only the center of said lug member and to cause the melt therefrom to flow by gravity through said aperture into said cavity in sufficient quantity to substantially fill said cavity and said aperture;

inverting said previously oriented case and applying the arc of an inert-gas-shielded, nonconsumable-electrode, arc welding torch to the backside of said other lug member such as to fuse through substantially only the center thereof and weld it to the one lug material filling the cavity; and

squeezing the lugs together to form a substantially fluid-tight intercell connector through said aperture.

4,177,552

METHOD OF MAKING LAMINAR BATTERIES

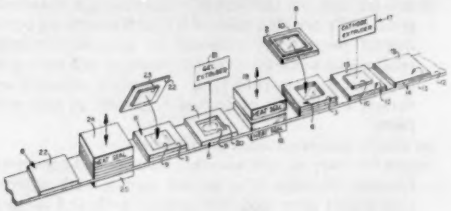
Michael E. Gordon, Wayland, and Frank Stieger, Newton Highland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 852,919, Nov. 18, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,780

Int. Cl.[2] H01M *6/00, 6/46*

U.S. Cl. 29—623.4 **2 Claims**

1. In the process of making a laminar battery, the steps of extruding a slurry electrode onto a central region of the surface of a conductive plastic substrate, adhering a separator to a first side of a laminated frame of larger area than the separator and formed with a central opening adapted to register with and receive said electrode with the separator extending over said opening and beyond the border of said opening and the frame having border portions extending beyond the border of the separator, said frame being a laminate of two heat activatable thermoplastic adhesive materials, a first of said materials on said first side of the frame being adhesively activatable at a first temperature below the temperature at which a second of said materials is adhesively activatable under the same conditions of



applied pressure and duration of heating, said separator being adhered to said first side of said frame by heat and pressure for a time sufficient to activate said first material but not said second material, placing said frame and said separator adhered thereto over said electrode and conductive plastic substrate with said electrode within said opening and said separator in registry and in contact with said electrode and extending beyond the borders of said electrode and said first side of said frame being in contact with said conductive plastic substrate beyond the borders of said separator, and adhering said frame to said conductive plastic by the application of heat and pressure for a time sufficient to activate said first material but not said second material.

4,177,553

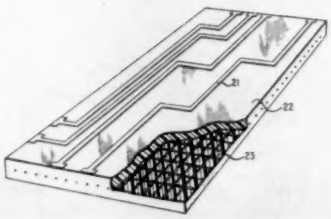
REINFORCED FLEXIBLE PRINTED WIRING BOARD

Theodore H. Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 701,591, Jul. 1, 1976, Pat. No. 4,103,102. This application Feb. 27, 1978, Ser. No. 881,706

Int. Cl.[2] H05K *3/10*

U.S. Cl. 29—625 **7 Claims**



1. A method of forming a reinforced flexible printed wiring board comprising:

(a) coating a continuous glass fiber with a lubricant;

(b) twisting relatively at least one continuous glass fiber about at least one continuous polyester fiber with a periodicity between 0.1 and 10 twists per inch, to form a yarn;

(c) weaving the yarn into a fabric;

(d) removing between 5 and 75 percent of the lubricant from the yarn at temperatures less than 300 degrees F.;

(e) impregnating the fabric with a flexible resin;

(f) curing at least partially the flexible resin; and

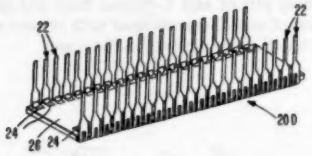
(g) defining a metallic circuit on the resin impregnated fabric, whereby, a flexible printed wiring board with peel strength greater than three pounds per inch of conductor width, insulation resistance greater than 1×10^9 ohms, propagation tear strength greater than 0.5 pounds and dimensional stability greater than 2 mils per inch is fabricated.

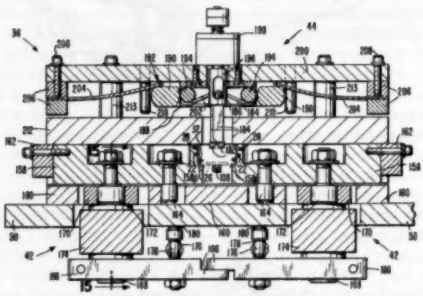
4,177,554

ASSEMBLING LEADS TO A SUBSTRATE

Ernest E. Deveres, Lowell; Paul J. Ouellette, Amesbury, and Joseph F. Pollitt, Bradford, all of Mass., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,220
Int. Cl.[2] H05K *3/32*
U.S. Cl. 29—626 **19 Claims**





1. A method of assembling leads to a substrate wherein the leads project in spaced parallel relationship from a continuous support rail, which comprises:

supporting the substrate in a lead-substrate assembling position;

simultaneously feeding a pair of independent support rails along essentially parallel paths to locate leads on the support rails on opposite sides of the lead-substrate assembling position;

engaging outer portions of the leads in the lead-substrate assembling position and moving the leads in opposite directions toward a substrate in the lead-substrate assembling position to assemble the leads to respective opposite sides of the substrate simultaneously;

engaging inner portions of the leads in the lead-substrate assembling position simultaneously with the engaging of the outer portions of the leads, to retain terminal-engaging portions of the leads in alignment with respective terminals on the substrate as the leads are assembled to the substrate; and

cutting the support rails to sever the leads in the lead-substrate assembling position from the remaining leads on the support rails.

3. Apparatus for assembling leads to a substrate wherein the leads project in parallel relationship from respective independent support members, which comprises:

means for supporting the substrate in a lead-substrate assembling position;

first and second lead-engaging means engageable with outer portions of respective ones of the leads for moving the leads toward the substrate in the lead-substrate assembling position to assemble the leads to respective opposite sides of the substrate simultaneously;

first moving means for moving the first and second lead-engaging means from retracted positions into advanced positions in which the first and second lead-engaging means assemble the leads to the substrate in the lead-substrate assembling position;

first and second lead-alignment retaining means engageable with inner portions of respective ones of the leads to clamp the leads to the first and second lead-engaging means, respectively, for retaining terminal-engaging portions of the leads in alignment with respective terminals on the substrate in the lead-substrate assembling position as the first and second lead-engaging means assemble the leads to the substrate;

second moving means for moving the first and second lead-alignment retaining means from retracted positions into advanced positions in which the lead-alignment retaining means engage the inner portions of respective ones of the leads, the second moving means including means for urging the first and second lead-alignment retaining means into engagement with the inner portions of the leads and permitting inward movement of the lead-alignment retaining means in response to movement of the leads by the first and second lead-engaging means into assembled relationship with the substrate in the lead-substrate assembling position; and

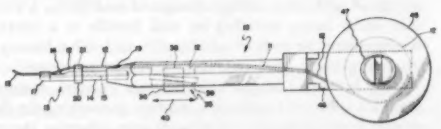
first and second return means for returning the first and second lead-engaging means, and the first and second lead-alignment retaining means, respectively, to their retracted positions.

4,177,555

WIRE-WRAPPING TOOL FOR NON-STRIPPED WIRE

David Weltman, Pleasantville, and Thomas Rivera, New York, both of N.Y., assignors to O.K. Machine and Tool Corp., New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,436
Int. Cl.[2] B21F *15/04;* H01R *11/08*
U.S. Cl. 29—751 **11 Claims**



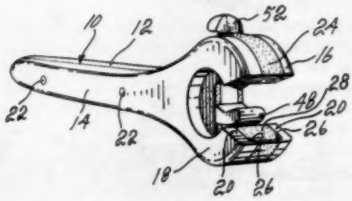
2. A novel wrapping bit configuration for wire-wrapping a non-stripped and non-slitted insulated wire around a terminal, comprising an elongated shaft having adjacent terminal-receiving and wire-supplying passageways terminating in adjacent holes at a bit face surface at a forward end of the shaft, and forwardly-projecting parallel wall portions on the bit face surrounding the terminal-receiving hole, said forwardly-projecting parallel wall portions forming a channel having a depth at least equal to twice the overall diameter of the insulated wire and with the parallel walls spaced apart by an amount approximately equal to the sum of the terminal corner-to-corner dimension, the wire core diameter, and the wire insulation wall thickness, said channel being tilted with respect to a line perpendicular to the terminal-receiving and wire-exiting holes at an angle of approximately 20°–35° in the direction opposite to bit rotation during use, whereby upon rotation of the shaft the bit face crushes an insulated wire as it exits from the wire-supplying hole and is wrapped around a terminal located in the terminal-receiving hole causing the insulation adjacent the terminal corners to be pierced baring the wire core and causing the bared wire core to form a good electrical connection to the terminal.

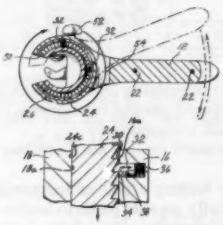
4,177,556
WATER DISPENSING RAZOR
Ralph Galli, Jr., 191 Bay 32nd St., Brooklyn, N.Y. 11214
Filed Mar. 27, 1978, Ser. No. 890,458
Int. Cl.[2] B26B *21/40*
U.S. Cl. 30—41 **3 Claims**

1. A liquid dispensing razor comprising:
(a) an elongated handle;
(b) a shaving head at one end of said handle, said handle having a longitudinal passageway therethrough and an opening at the other end thereof for connection to a source of liquid, a razor blade, said head further including a supporting surface for receiving and supporting said razor blade thereon, said razor blade having opposed lateral first and second surfaces and a pair of opposed marginal edges, one of said marginal edges being sharpened along the length thereof, said first lateral surface being disposed in touching engagement with said supporting surface, said handle having a laterally extending slotted opening disposed over said second lateral surface of said blade and adjacent the other of said marginal edges of said blade, said slotted opening communicating with said longitudinal passageway for directing said liquid across only said second lateral surface of said blade, said first lateral surface being located intermediate said second lateral surface and said other end of said handle, said slotted opening being substantially equal in length to the length of said other marginal edge of said blade, a valve, said valve being installed on said handle at a location intermediate the ends of said handle, said valve having an operating lever, said operating lever being located outwardly from said handle adjacent said location, means to bias said valve into a closed condition preventing the flow of said liquid through said passageway, whereby the momentary manual operation of said operation of said operating lever allows said liquid to flow through said passageway and over substatially all of said second lateral surface of said blade and over said one marginal edge of said blade.

4,177,557
TUBE CUTTER WITH A RATCHET HANDLE
Aurèle Courty, 471 Sainte-Madeleine St., Montreal, Quebec, Canada H3K 2K8
Continuation-in-part of Ser. No. 869,346, Jan. 13, 1978.
Filed Aug. 31, 1978, Ser. No. 938,537
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—102 **3 Claims**

1. A tube cutter comprising:
(a) an elongated handle formed in two longitudinal symmetrical half portions secured together and having a C-shaped head at one end also formed in two symmetrical half portions spacedly facing each other, each head half portion being integral with one handle half portion, said C-shaped head defining a lateral opening through which a tube can be inserted, each head half portion having an inner radial side face and a peripheral shoulder projecting from said inner radial side face and directed towards the shoulder of the other head half portion;
(b) a C-shaped body rotatably mounted between the two head half portions and defining a lateral opening of substantially the same width as the lateral opening of the C-shaped head, said body having a peripheral outer face exposed between the shoulders of the two head half portions and radial external side faces in sliding contact with the respective inner radial side faces of said head half portions whereby said C-shaped body can rotate with respect to said elongated handle about an axis transverse to said C-shaped body, the latter being rotatably guided by said peripheral shoulders of said head half portions;
(c) pawl and ratchet means entirely located at one of the radial body side faces and at the contacting inner radial side face of the corresponding head half portion, said pawl and ratchet means being arranged concentric with the rotational axis of said C-shaped head and allowing free rotation of said C-shaped head with respect to said elongated handle in one direction only; and



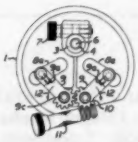


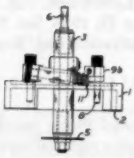
(d) a tube cutter assembly mounted on said body, a tube abutment member slidably mounted in said body for radial movement towards and away from the cutter member and in a direction transverse to said lateral opening, and control means mounted on said body projecting outwardly from the exposed peripheral outer face of said body to move said abutment member towards said cutter member to press a tube between the two members, said two members having a spacing therebetween in register with the lateral openings of said body and said head, whereby a pipe can be inserted through the registering openings in said body and in said head and between said two members, and said cutter member pressed against said tube whereby back-and-forth rotation of said handle causes rotation of said body and cutter member through said pawl and ratchet means to cut the tube, and wherein said handle half portions define a through opening adjacent said body for the free passage of said externally projecting control means during rotation of said body relative to said handle.

4,177,558
INTERNAL CUTTER FOR TRIMMING PLASTIC PIPE

Thomas G. Brown, Erie, Pa., assignor to Reed Manufacturing Company, Erie, Pa.

Filed Mar. 3, 1978, Ser. No. 883,239
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—103 **3 Claims**



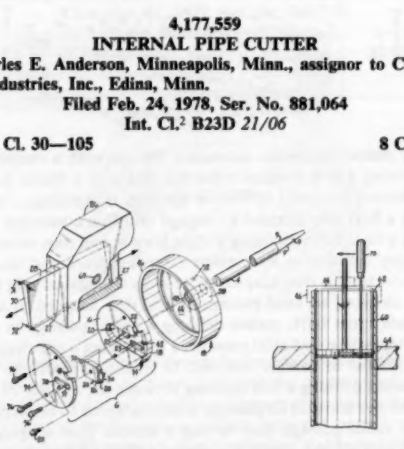


1. A cutter for trimming roughed in plastic pipe to a predetermined level relative to the surface of a floor or wall through which the pipe extends, comprising a housing surrounding the pipe to be trimmed, means riding in load carrying relation to said surface for supporting the housing for movement over said surface and for rotation around said pipe, a circular saw jounaled in the housing on an axis perpendicular to said surface, said saw being vertically adjustable along said axis to select the level of the saw relative to said surface, guide members forming with the saw the locus of a circle, means for retracting said guide members radially inward toward the saw to reduce the diameter of said circle so the saw and guide members may be telescoped within said pipe and means for extending said guide members radially outward away from the saw to increase the diameter of said circle and force the saw through said pipe, said guide members riding on the internal surface of said pipe and guiding the saw as the housing while supported on said surface by its supporting means is rotated about said pipe to cut off the projecting end of said pipe.

4,177,559
INTERNAL PIPE CUTTER

Charles E. Anderson, Minneapolis, Minn., assignor to Cherne Industries, Inc., Edina, Minn.

Filed Feb. 24, 1978, Ser. No. 881,064
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—105 **8 Claims**

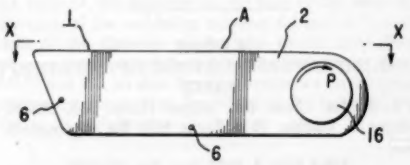


1. An internal pipe cutter for cutting a pipe having a predetermined thickness, which comprises:
(a) a rotatable mandrel;
(b) a cutting drum and guide drum carried on the mandrel and adjustably mounted relative to one another such that the longitudinal spacing therebetween can be varied;
(c) the guide drum having means for controlling the depth at which the cutting drum is positioned in the pipe; and
(d) the cutting drum having a cutter which is projected radially outwardly by centrifugal force as the mandrel is rotated to cut the pipe, wherein the cutter comprises a slider block slidably received in the cutting drum and carrying a cutting blade therein, the cutting blade being radially adjustable relative to the slider block, wherein the slider block has a slot which loosely receives the cutting blade therein and a set screw which bears against the cutting blade to hold the cutting blade in an adjusted radial position relative to the slider block; and wherein the cutting drum has an elongated radial slot through which the set screw extends, the outward movement of the slider block being limited by engagement of the set screw with a radially outer end of the cutting drum slot, wherein the outer end of the cutting blade slot is positioned relative to the screw and the cutting blade is positioned relative to the slider block such that the cutting blade cuts through the predetermined thickness of the pipe substantially simulataneously with the engagment of the set screw with the outer end of the cutting drum slot to prevent the cutter from being projected outwardly past the pipe after the pipe has been cut.

4,177,560
SAFETY KNIFE

Hiroshi Sakurai, 7-2 Inago-cho, Seki-shi, Gifu, Japan

Filed Aug. 8, 1978, Ser. No. 931,881
Claims priority, application Japan, Oct. 22, 1977, 52/142660[U]
Int. Cl.[2] B26B *1/04*
U.S. Cl. 30—160 **2 Claims**



1. A safety knife comprising a pair of side plates, a blade, an interplate and a pin, wherein said blade has a locking slot at a top and another locking slot at a bottom thereof, a rack insertion hole and an opening in which a shaft pin provided with gear is fixed, said rack insertion hole having such a size and being provided in such a portion of said blade that a rack can travel smoothly therethrough engaging with the gear provided around said shaft pin, and
said interplate has a spring portion and a locking claw at the end of said spring portion, said locking claw being to interact with said locking slots.

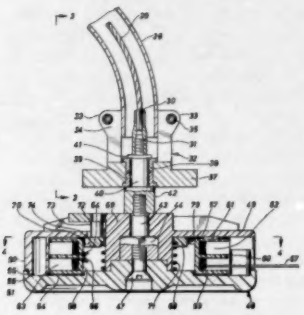
4,177,561
ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Division of Ser. No. 706,623, Jul. 19, 1976, abandoned. This application May 31, 1977, Ser. No. 801,536
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **20 Claims**

1. Apparatus for cutting vegetation and the like, comprising a housing rotatable in a cutting plane about an axis and having at least one internal compartment and at least two peripheral apertures communicating with said compartment and each being defined at least partially by a curvilinear wall portion of said housing,

a spool-like member removably insertable in said housing, said spool-like member including a wall member extending generally perpendicularly to said cutting plane and at least three flange elements extending outwardly from said wall member in planes substantially parallel to said cutting plane, each flange element being spaced from the other along said axis and defining with said wall member a pair of storage compartments,



a flexible line member having a coiled portion stored in each said storage compartments and having a non-coiled portion extending from each said storage compartments through one of said peripheral apertures and outwardly of the periphery of said housing for travel in said cutting plane, and

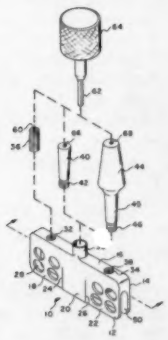
a pair of metallic bearing elements each being disposed within one of said peripheral apertures and each being in abutting engagement with the curvilinear wall portion of the housing defining the aperture.

4,177,562

DENTAL IMPLANT AND METHOD OF INSERTING THE SAME

Alvin L. Miller, Creek Rd., Mount Holly, N.J. 08060, and Anthony J. Viscido, 7015 Keene Mill Rd., Springfield, Va. 22150

Filed May 2, 1977, Ser. No. 792,522
Int. Cl.[2] A61C *8/00*
U.S. Cl. 433—174 **12 Claims**



1. A dental implant comprising:

a body member, said body member having a top and having side by side first and second body portions attached to each other;

said first portion including spaced apart and substantially parallel side walls and means accessible from the top of said implant for moving at least part of said side walls outwardly away from each other; and

said second portion including a substantially vertically extending hollow bore therein, said bore being open at the top of said implant and including screw threads adjacent the lower portion thereof.

4,177,563

DENTAL FILLING MATERIAL

Robert Schmitz-Josten, Cologne; Manfred Borgardt, Wuppertal; Hans-Hermann Schulz, Leichlingen; Michael Walkowiak, Cologne; Bernhard Leusner, Leverkusen, and Carlhans Süling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,639
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728764
Int. Cl.[2] C08K *3/22, 3/34, 3/36*
U.S. Cl. 433—228 **12 Claims**

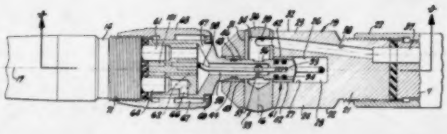
1. A formulated dental filling material comprising a polymerizable organic plastics material containing inorganic fillers, which filling material comprises at least two pastes in intimate admixture with one another in a paste/paste system in which hardening is initiated by means of a peroxidic initiator and an accelerator, wherein said at least two pastes contain different inorganic fillers with different chemical constitutions such that one of said at least two pastes contains filler with a substantially higher proportion of elements with high atomic number than does the other of said at least two pastes.

4,177,564

DENTAL HANDPIECE CONNECTOR

Lloyd P. Flatland, 15 Quisisana Dr., Kentfield, Calif. 94904

Filed Mar. 20, 1978, Ser. No. 887,864
Int. Cl.[2] A61C *1/10*
U.S. Cl. 433—82 **7 Claims**



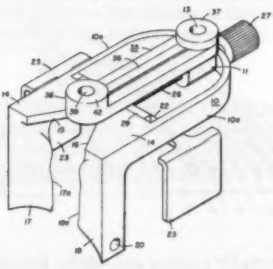
1. A dental handpiece connector for use with a dental air tube having a first connector thereon and with a dental handpiece having a second connector thereon, comprising a body having a first base adapted to engage said first connector and having a tine, means defining a cross bore in said tine, means in said body defining an air passage extending from said base to said cross bore, a disc adapted to be received against said tine, means defining an axial passage in said disc adapted to align with said cross bore, means defining a radial passage in said disc intersecting said axial passage, a pin having a pin chamber and arranged to confine said disc to rotation relative to said tine, means defining a first opening between the interior of said pin chamber and said air passage, a stem adapted to be received in said radial passage and having a second base adapted to engage said second connector, means defining a stem passageway in said stem, means defining a second opening between said stem passageway and said pin chamber, and means for confining said stem to rotation in said radial passage relative to said disc.

4,177,565

PROXIMAL BOX JIG

John M. Heasley, 307 - 22nd St., NE., Cedar Rapids, Iowa 52402

Filed Aug. 7, 1978, Ser. No. 931,509
Int. Cl.[2] A61C *3/00*
U.S. Cl. 433—75 10 Claims



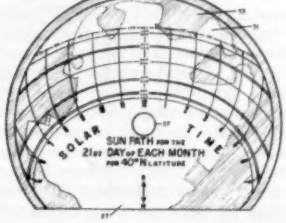
1. A jig for the cutting of proximal boxes in dentistry comprising: a guide table having a pair of spaced interproximal retentive arms extending in one transverse direction from the guide table, the retentive arms having opposed embrasure portions effective to engage the opposite embrasure areas between adjacent teeth, the spacing between the retentive arms being variable in order for the embrasure portion to clampingly engage said embrasure areas in order to support the guide table in overlying relation to a tooth to be provided with a proximal box, the guide table having spaced opposed buccal and lingual wall guide surfaces disposed transversely of the guide table; and a paralleling member mounted to the guide table for paralleling movement over the guide table in a plurality of directions, the paralleling member including dental burr holding means adapted to receive and dispose a dental burr transversely of the guide table for movement between the buccal and lingual wall guide surfaces during said movement of the paralleling member in order to determine the location of the buccal and lingual walls of a proximal box.

4,177,566

INSOLATION SURVEY DEVICE

Bernard M. Haines, Box 914, Glenwood Springs, Colo. 81601

Filed Dec. 21, 1977, Ser. No. 862,778
Int. Cl.[2] G01C *1/00*
U.S. Cl. 33—1 DD 12 Claims



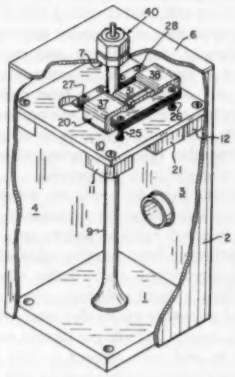
1. An insolation survey device for forming visual representation of the quantity of direct, time-varying exposure of a preselected location to solar radiation comprising means reflecting said radiation for forming a visible, reflected pattern corresponding to said areas of direct radiation, calibrated display sheet means for forming a composite visual image of said calibrations with said visual reflected patterns; direction indicating means for said display sheet and means for leveling said display sheet with respect to the horizontal.

4,177,567

TRACER HEAD

Walter S. Limbach, 2nd, Eighty-four; Jon R. Swoager, and James M. Swoager, both of Imperial, all of Pa., assignors to Automation Equipment Inc., Pittsburgh, Pa.

Continuation of Ser. No. 762,523, Jan. 26, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 965,399
Int. Cl.[2] B43L *13/10*; H01F *21/06*
U.S. Cl. 33—23 K 3 Claims



1. A tracer head comprising a base, a stylus mounted to the base and extending away therefrom for engagement with the edge of a template, means for detecting deflection of the unfastened end of the stylus,

the improvement comprising:

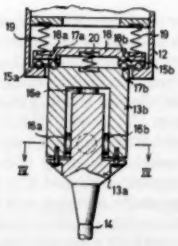
said stylus being an elongate solid cylindrical rod having near its base an integral flared skirt having a smooth and consistent tangency with the cylindrical wall of the stylus, the ratio of the diameter of the base of the skirt to the diameter of the rod being between 4:1 and 1.5:1 and the ratio of the diameter of the base to the axial distance between the base and the point of tangency being between 1:0.75 and 1:2, so that the skirt comprises an integral 360 degree restoring spring for returning the rod after deflection to its null position.

4,177,568

MEASUREMENT HEAD

Walter Werner, Königsbronn; Klaus Herzog, Oberkochen, and Franz Szenger, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,241
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712181
Int. Cl.[2] G01B *7/02*
U.S. Cl. 33—174 L 24 Claims



1. A measurement head for determining the coordinates in

space of any points of a workpiece moved relative to the measurement head, comprising a mounting part and a movable part, said mounting part being adapted to be fixedly mounted and having means establishing a fixed reference plane of probe support, whereby a fixed reference axis is also established normal to said plane, said movable part having a probe axis which in a position of rest is aligned with said fixed reference axis, coupling means tiltably and yieldably supporting said movable part with respect to said mounting part and permitting said movable part and its probe axis to tilt with respect to said fixed reference axis, said coupling means including loading means axially operative to normally urge said movable part into said position of rest wherein said movable part is in a precise position in space with respect to said mounting part, said movable part consisting of a base member and a probe member connected to each other via one or more measuring elements which are highly sensitive to tension and compression, said base member being the means whereby said movable part is tiltably and yieldably supported.

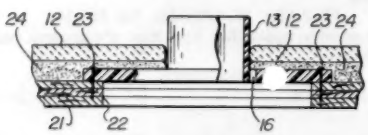
23. Measurement-head structure for mounting a work-contacting probe in a machine for ascertaining coordinate data pertaining to selected surface points on a workpiece, said structure comprising a base member adapted for fixed mounting to a probe-supporting part of the machine and having means establishing a fixed reference plane of probe support, whereby a fixed reference axis is also established normal to said plane, coupling means including a tiltable and yieldable member supported by and with respect to said base member and having an at-rest position determined by said reference plane of probe support, means acting in the direction of said axis and normally loading said coupling member into a precise position and orientation in space with respect to said base member, a work-contactable probe member coupled to said coupling member, said probe member being in alignment with said axis when said structure is in at-rest condition, said probe member extending for probe-to-work contact at axial offset from said plane, and strain-gage means carried by said coupling member and producing an electrical output signal in response to a stress change in said coupling member, whereby said strain-gage means is instrumental in determining precisely such initial workpiece contact by said probe member as to cause a stress change in said coupling member.

4,177,569

TEMPLATE FOR LOCATING HOLES FOR FAUCET AND BASIN IN VANITY-TYPE SINK COUNTERS

John G. Greer, 1028 Alameda, Redwood City, Calif. 90261

Filed Apr. 6, 1978, Ser. No. 894,185
Int. Cl.[2] G01B *1/00*
U.S. Cl. 33—174 G **8 Claims**



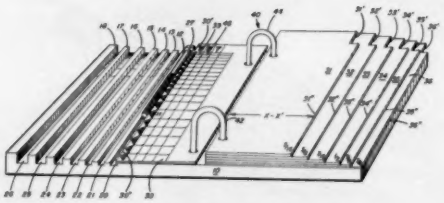
1. A template for use in combination with a sink counter to lay tile on said sink counter or vanity surrounding a first hole in the counter vanity through which a faucet is subsequently to be installed, said template further being used to aid the tile setter in locating the tile and insuring that said first hole is not obstructed by cement and/or tile, said template comprising, a base larger than said first hole and having means associated therewith for permanently securing said base to said counter approximately concentric with said first hole, a cylinder, and means at least temporarily securing said cylinder to said base upstanding from the surface of said base opposite said counter, said base being formed with a second hole substantially smaller than said first hole and approximately concentric with said cylinder.

4,177,570

APPARATUS FOR GAUGING AND PRICING FASTENERS

Allan R. Hewitt, 17 S. Church St., DuBois, Pa. 15801

Filed Apr. 10, 1978, Ser. No. 894,904
Int. Cl.[2] G01B *5/02*
U.S. Cl. 33—174 R **8 Claims**



1. Apparatus for gauging and pricing fastening devices, said apparatus comprising:

a base member that includes an array of elevated portions forming therebetween an array of parallel channels, each of said channels corresponding to a predetermined fastener gauge such that said parallel channels gauge a fastener disposed in one of said parallel channels;

a plurality of indexing pages that respectively cooperate with a single corresponding parallel channel of said base member to measure the axial length of a fastener disposed in the corresponding parallel channel; and

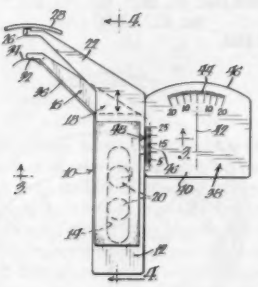
means for binding said indexing pages to said base member such that said indexing pages can be selectively turned between first and second positions that oppose said base portion on opposite sides of said binding means, the major exposed surface of indexing pages in one of said positions displaying the price of the fastener in accordance with the measured length.

4,177,571

OPHTHALMIC DEVICE FOR MEASURING VERTEX DISTANCE AND PANTOSCOPIC TILT ANGLE

Gary L. Renier, 3726 Fairway Rd., Fargo, N. Dak. 58102

Filed May 22, 1978, Ser. No. 908,127
Int. Cl.[2] A61B *3/10*
U.S. Cl. 33—200 **5 Claims**



1. An ophthalmic measuring device for determining the vertex distance between the optical centers of the anterior surfaceof the closed eyelid and the posterior spectacle surface of a trial lens mounted in a frame, which device is comprised of a generally planar member having a body portion, a measuring arm connected to said body portion, a second measuring arm, one of said arms including an eyelid contacting tip for engaging the optical center of the closed eyelid, said eyelid contacting tip being flattened and widened in the plane perpendicular to the general plane of said device and the other of said arms

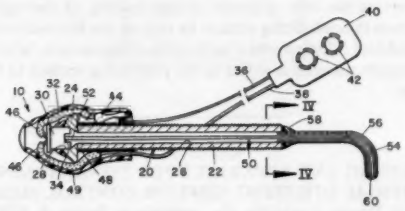
including a rounded trial lens contacting tip for engaging the optical center of the posterior spectacle surface, means slidably connecting said measuring arms and permitting relative movement therebetween, said arms being disposed at an obtuse angle relative to said body portion, and a measuring scale and indicating means placed, one with respect to each of said arms, whereby the vertex distance may be read directly from said scale and indicating means when said arms are moved to contact the optical centers of the anterior surface of the closed eyelid and the posterior lens surface, respectively.

4,177,572

LIGHTED SIGHT PIN FOR ARCHERY BOWS

Ted E. Hindes, 7822 Myers Lake Ave., Rockford, Mich. 49341

Filed Jun. 28, 1978, Ser. No. 919,979
Int. Cl.[2] F41G *1/46, 1/34*
U.S. Cl. 33—265 **18 Claims**



1. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; said light source being a light-emitting diode received in an enlarged portion of said passageway in said holding means; said light-emitting diode including a recess aligned with said passageway; said light-transmitting means having one end extending into said recess, a generally rectilinear portion, and an opposite end extending beyond the end of said rigid shaft, said opposite end extending at a right angle to said generally rectilinear portion.

5. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; said rigid shaft being threaded on its exterior for securement to a sight-supporting member.

15. A light sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; and a protective tube around said shaft adjacent said holding means to protect said voltage applying means therearound from abrasion.

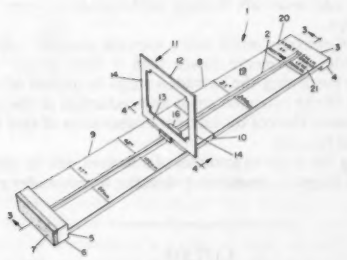
17. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; and a rigid, hollow member extending from said other end of said rigid shaft and having a cross-sectional area smaller than that of said rigid shaft; said light-transmitting means extending through said smaller, hollow member to the free end of said smaller, hollow member whereby said light-transmitting means is protected along its entire length by said rigid shaft and smaller, hollow member with said free end of said smaller, hollow member and the protected light-transmitting means providing a small, lighted sighting tip enabling proper aiming and accuracy while shooting using the sight pin.

4,177,573

VARIABLE ANGLE APERTURE CARD

James D. Boston, III, 565 Chantilly Dr., Sierra Vista, Ariz. 85635

Filed Jun. 7, 1978, Ser. No. 913,460
Int. Cl.[2] G01C *3/00*
U.S. Cl. 33—277 **5 Claims**



1. In a variable angle aperture card for framing a scene to be photographed and determining the best camera equipment required and selection of lens to isolate that view, an elongated flat bar, said bar being divided into at least two sections, said sections being hinged together for folding, an elongated central slot in said bar extending generally end to end thereof, a rectangular viewing aperture card having fixed horizontal and vertical frame members forming a fixed viewing aperture correlating in size to that of available standard photographic print sizes, slide means arranged for sliding movement lengthwise of said slot, said card being hingedly mounted on said slide means and being foldable relative thereto, degree of acceptance and equivalent lens focal length scales removably and longitudinally affixed to the upper face of said bar on

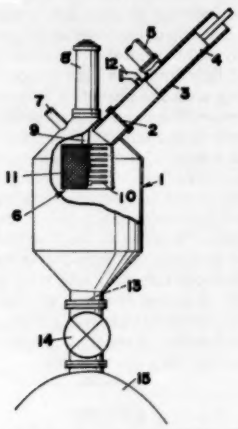
either side of said slot, whereby a photographer may view therethrough to frame the scene and determine from said scales the angle of view for different camera formats and the lens to best photograph the view from the position at which the framing was made.

4,177,574

METHOD AND APPARATUS FOR GRANULATING HYDRATED MATERIALS INCLUDING FOOD STUFFS

Masakazu Kobayashi, Tokyo, and Koh Harashima, Kawaguchi, both of Japan, assignors to Kanesa Miso Kabushiki-Kaisha, Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,796
Claims priority, application Japan, Mar. 12, 1977, 52/27496
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **4 Claims**



1. A method of granulating hydrated materials including food stuffs which comprises;

processing said materials to a paste-like phase having an intermediate moisture content which is higher than the plastic limit of said processed materials, and which falls in the range of approximately 12–40% on a dry basis,

extruding said materials through perforations to form them into strips,

feeding the extruded strips into a vacuum chamber which is kept under a pressure lower than 4 Torr to 0.1 Torr, thereby hardening the extruded strips by means of rapid cooling of the extruded strips and reduction of the moisture content thereof by vacuum evaporation of said moisture content, and

converting the strips to granules of a desired size by subjecting said strips to mechanical shearing forces under a vacuum.

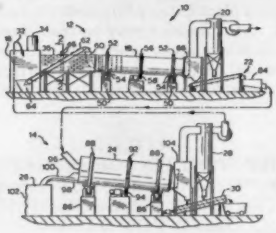
4,177,575

ORGANIC MATERIAL TREATMENT PROCESS

Alfred W. Brooks, St. Thomas, Canada, assignor to Cannon Limited, Hamilton, Bermuda

Division of Ser. No. 834,735, Sep. 19, 1977, Pat. No. 4,137,029.
This application Oct. 30, 1978, Ser. No. 956,139
Int. Cl.[2] F26B *3/04*
U.S. Cl. 34—13 **16 Claims**

1. A method of drying and pelletizing organic material such as sewage, the method comprising: introducing the organic material into a rotating louvred drying drum having longitudinal, circumferentially spaced-apart, radially inwardly disposted louvres, said drum having an input section, an output section and a central pelletizing section formed by adjacent portions of the input and output sections; passing heated air through the louvred drying drum input section louvres to dry the material, said air being at a temperature between 500° and 800° F. and at a velocity through the drum between 200 and 400 feet per minute; passing cooling air through the louvred drying drum output section louvres to cool the material; and



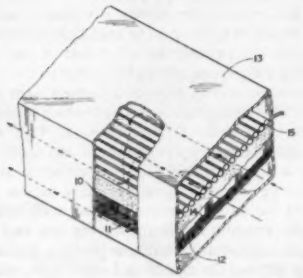
interrupting the flow of heated air and cooling air through the louvres in the pelletizing section by closing the louvres to form a cylindrical rolling surface in the pelletizing section, whereby the organic material is rolled in the pelletizing section to form pellets.

4,177,576

METHOD AND APPARATUS FOR CONDITIONING MATERIAL UTILIZING AIRFLOW CONTROL MEANS

John D. Psaras, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 705,739, Jul. 15, 1976, Pat. No. 4,091,824.
This application Feb. 13, 1978, Ser. No. 877,154
Int. Cl.[2] F26B *3/04*
U.S. Cl. 34—33 **17 Claims**



17. A method of conditioning material comprising:

transporting the material on a conveyor along a path, and

directing a stream of conditioned gas at the material through a honeycomb structure coextensive with said conveyor to spread the gas stream evenly across the surface of the conveyor for uniform conditioning of the material.

4,177,577

SHELF ARRANGEMENT FOR FREEZE DRYING APPARATUS

Harry L. Bird, Red Hook, N.Y., assignor to The Virtis Company, Inc., Gardiner, N.Y.

Filed May 16, 1978, Ser. No. 906,678
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **7 Claims**

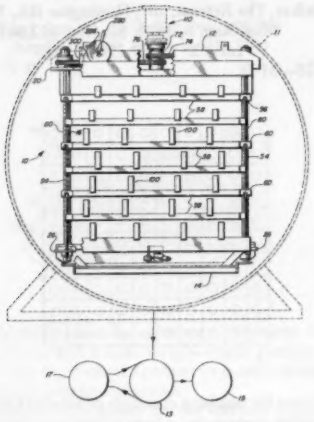
3. In an apparatus having a mechanism to be rotatably driven, an improved driving means comprising:

a base plate;

a motor means mounted on the base plate having an output shaft positioned essentially perpendicular to said base plate;

means for mounting said base plate on the apparatus so that said base plate can pivot about said output shaft;

adjustable limit means mounted adjacent said base plate for limiting the pivoting of said base plate, said limit means including adjustable torque sensing means that senses the torque exerted by said output shaft and causes said motor to cease operation when a predetermined torque is sensed.



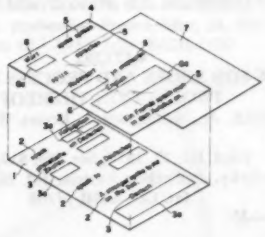
damping means connected to said base plate for absorbing transient forces, the capacity of said damping means to absorb transient forces being directly related to the magnitude of such transient forces, thereby preventing said base plate from being rapidly pivoted in response to transient forces.

4,177,578

MULTI-PAGE PROBLEM AND ANSWER WORKBOOK

Takeshi Yamamoto, Fujinodai-Danchi 1-20-106, Honmachida 3486, Machida-shi, Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 866,399
Claims priority, application Japan, Mar. 2, 1977, 52/23876[U]
Int. Cl.[2] G09B *3/02*
U.S. Cl. 35—9 R **6 Claims**



1. A multi-page problem and answer workbook comprising:

a first page having thereon a problem section setting forth a problem to be answered and an adjacent expected answer guide section on which a student may place an expected answer to said problem;

a transparent second page superimposable over said first page, said second page having thereon an answer section setting forth the correct answer to said problem of said problem section on said first page and an adjacent expected problem guide section on which the student may place an expected problem which is correctly answered by said correct answer;

said answer section and said expected problem guide section being positioned on said second page such that when said second page is superimposed over said first page said answer section and said expected problem guide section respectively overlie said expected answer guide section and said problem section of said first page and;

an opaque sheet means, selectively insertable between said first and second pages, for preventing said problem section and said expected answer in said expected answer guide section on said first page from being visible through said second page when said second page is superimposed over said first page;

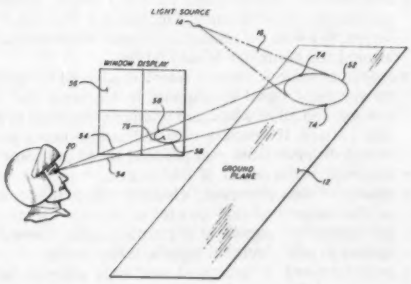
whereby said expected answer guide section of said first page comprises means for allowing the student to insert an expected answer to said problem of said problem section by using said first page only, said expected problem guide section of said second page comprises means for allowing the student to insert an expected problem which is answered by said correct answer of said answer section by using said second page only, and said correct answer of said answer section may be compared with said expected answer inserted in said expected answer guide section and said problem in said problem section may be compared with said expected problem inserted into said expected problem guide section when said second page is superimposed over said first page.

4,177,579

SIMULATION TECHNIQUE FOR GENERATING A VISUAL REPRESENTATION OF AN ILLUMINATED AREA

David L. Peters, Whitney Point; Arthur P. Schnitzer, Vestal; John R. Trzeciak, Binghamton, and Brain J. Woycechowsky, Vestal, all of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,683
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 N **14 Claims**



1. Apparatus for providing on a viewing surface of a raster scan television display a simulated view from an eyepoint of a changeable illuminated area located on a plane surface where the source of illumination is a cone of light, whose orientation can be varied, whose apex can be located at any distance from said eyepoint and said plane surface, and whose conical surface intersects said plane surface comprising:

a. means for generating first signals representative of changeable relative geometrical relationships between locations and orientations of said plane surface, said eyepoint, and said cone of light;

b. means for generating second signals representative of the position on said viewing surface of a line of sight from said eyepoint through said viewing surface to a plane surface intersection point;

c. a signal processor receiving and combining said first and second signals such that a third signal is generated representative of the location of the line of sight plane surface intersection point relative to a conic section generated by the intersection of the cone of light with the plane surface;

d. a signal comparator responsive to said third signal which determines whether said plane surface intersection point lies within, on, or outside said conic section; and

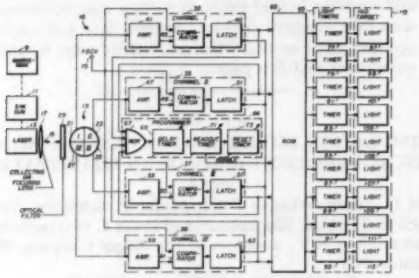
e. a video processor responsive to said signal comparator for modulation of said raster scan display, whereby the video modulation creates an illuminated area on the viewing surface corresponding to the plane surface intersection point when said point lies within or on the said conic section.

4,177,580

LASER MARKSMANSHIP TARGET

Albert H. Marshall, Maitland, and George A. Siragusa, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1978, Ser. No. 871,265
Int. Cl.[2] F41G *3/26*; F41J *5/08*
U.S. Cl. 35—25 **19 Claims**



1. A target system for indicating the general area of a radiant energy hit thereon, comprising in combination:

a target having a predetermined indicia mounted thereon;

a plurality of predetermined indicator means mounted on said target, with one thereof mounted at the center of said target, and with the remainder thereof mounted uniformly around the perimeter of said target;

a quartet of sensors, each of which is adapted for producing an electrical signal in response to receiving said radiant energy, and all of which are relatively disposed in a quadrant pattern, the pattern of which is disposed a predetermined distance from said predetermined indicator means mounted at the center of said target;

a quartet of data processing channels effectively connected to the outputs of said quartet of sensors for producing predetermined signals at the data outputs thereof in response to said electrical signals, respectively;

a predetermined programmed read only memory having a quartet of data inputs, an enable input, and a plurality of outputs, with the quartet of data inputs thereof respectively connected to the data outputs of said quartet of data processing channels, and with the plurality of outputs thereof effectively connected to the inputs of said plurality of predetermined indicator means;

a NOR gate, having a quartet of inputs effectively connected to the outputs of said quartet of data processing channels and an output;

an adjustable delay timer connected to the output of said NOR gate;

an adjustable readout timer having a data input, a data output, and an enable output, with the data input connected to the output of said adjustable timer, and the enable output connected to the enable input of said predetermined programmed read only memory for timely enabling said read only memory, so as to effect the reading out of the data stored in said read only memory, thereby effecting the activation of said plurality of predetermined indicator means in correspondence therewith; and

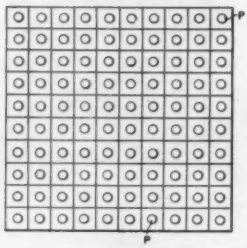
an adjustable reset timer having an input connected to the output of said adjustable readout timer, and an output effectively connected to the reset inputs of said quartet of data processing channels for timely resetting said data processing channels.

4,177,581

DEVICE FOR TEACHING CONCEPTS OF NUMBERS AND MATHEMATICAL PRINCIPLES

Hazel Walker, The Retreat, 107, Heslington Rd., York, England

Filed Aug. 8, 1977, Ser. No. 822,662
Int. Cl.[2] G09B *19/02, 1/10*
U.S. Cl. 35—31 D **8 Claims**



1. A device for teaching concepts of numbers and mathematical principles comprising a base component having a surface visibly divided by lines into a hundred identical unit squares in ten by ten format, and a series of number elements having denominations 1,2,3,4,5,6,7,8,9,10,20,30,40,50,60,70,80 and 90, each of said number elements being dimensioned so that it is adapted to cover as many unit squares on said base component as is represented by that number element, each of said number elements being marked with the number it represents but being free of any line markings indicating the number it represents, and at least some of said number elements being sufficiently transparent to allow said marked unit squares on said base to be visible through said number element when said number elements are placed on said base component, whereby when one of said transparent number elements, other than the element representing the number 1, is on said base component, it is visibly divided into the number of unit squares equal to the number it represents, but when said one transparent element is off said base component, it is not so divided.

4,177,582

SOLE FOR SHOES AND PROCESS FOR THE PRODUCTION THEREOF

Johann Ehrlich, Jr., Schulgasse 3, Krems/Weinzierl, Austria (A-3500)

Filed Jul. 27, 1977, Ser. No. 819,684
Claims priority, application Austria, Jul. 20, 1976, 5336/76
Int. Cl.[2] A43B *13/08*
U.S. Cl. 36—33 **9 Claims**

1. A sole construction for shoes comprising separate forward and rearward parts constructed entirely of wood, a flexible intermediate part interconnecting said forward and rearward parts, said intermediate part extending across said sole and being located adjacent the area adapted to be engaged by the ball of a wearer's foot, said intermediate part consisting of foamed polyurethane, containing polyisocyanate, chemically bonded to said wooden parts, said chemical bond forming the

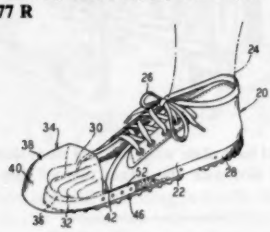
sole interconnection between said intermediate part and said forward and rearward parts.

4,177,583

ORTHOPEDIC SHOE WITH FOREFOOT PROTECTIVE GUARD

Andrew W. Chapman, 5711 Woodland Dr., Western Springs, Ill. 60558

Filed Apr. 13, 1978, Ser. No. 895,959
Int. Cl.[2] A43C *13/14;* A43B *7/00*
U.S. Cl. 36—77 R **10 Claims**



1. An orthopedic shoe for postoperative wear having a generally rigid sole and a light weight upper portion with an open front for the forefoot of a patient to extend therethrough wherein the improvement comprises:

a semi-rigid protective guard for the forefoot including:

a domical cover member having a vaulted forward portion and a pair of side portions defining a hollow safety zone which is adapted to extend about and to overlie the distal portion of a patient's foot in fixed, spaced relationship thereto,

a generally horizontal abutment means comprising an abutting end surface, depending from said forward portion and extending rearwardly therefrom into abutting engagement with a forward contoured surface of said rigid sole, and

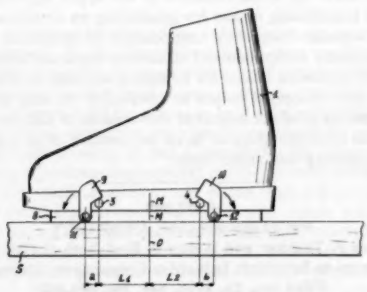
a mounting means extending rearwardly of said cover member for securing said protective guard to said orthopedic shoe in said fixed, spaced relationship relative to the distal portion of said patient's foot.

4,177,584

SKI BOOT AND BINDING ASSEMBLY

Jean J. A. Beyl, 10, Bd Victor-Hugo, 58000 Nevers, France

Filed Mar. 22, 1978, Ser. No. 889,001
Claims priority, application France, Mar. 28, 1977, 77 09159
Int. Cl.[2] A43B *5/04;* B62B *0/00*
U.S. Cl. 36—117 **7 Claims**



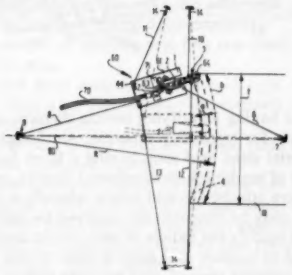
1. A ski-boot and ski-binding assembly for use with skis provided with a mounting mark, comprising in combination, transversely extending anchoring means carried by said ski boot, said means having a pair of projecting engaging surfaces on either side of the boot, longitudinally spaced on either side of the substantially longitudinal center of the boot, a casing mounted on said ski intermediate the boot and ski, said casing bearing a reference mark adapted to be aligned with a mounting mark on said ski, and a pair of retaining members on each side of said casing fixedly longitudinally spaced on each side of said reference mark and adapted releasably to engage the longitudinally spaced projecting surfaces of said anchoring means, whereby the center of said ski boot is aligned with the mounting mark on said ski.

4,177,585

METHOD AND APPARATUS FOR DREDGING

Jan de Koning, Amsterdam; Jan Steyn, Nieuw-Vennep, both of Netherlands, assignors to Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V., Amstelveen and Scheepswerf en Machinefabriek "De Liesbosch" B.V., Nieuwegein, both of Netherlands

Filed Feb. 8, 1978, Ser. No. 876,173
Int. Cl.[2] E02F *3/90*
U.S. Cl. 37—67 **10 Claims**



1. The method of dredging which comprises the steps of:

(a) moving a floating body laterally, while dredging material with a dredging head carried by the body, by anchoring side ropes at points laterally spaced from and on opposite sides of said body and hauling in one of said side ropes while paying out the other, whereby the dredger head traverses a dredging path;

(b) locating said body longitudinally during step (a) by a longitudinal rope connected with the rear of the body and anchored at a point spaced rearwardly from the body and by at least one further longitudinal rope connected with the bow of the body and anchored at a point spaced forwardly from the body, and applying tension to said longitudinal ropes; and

(c) controlling said dredging path to follow a predetermined path by sensing the tension in one of said longitudinal ropes and maintaining the sensed tension at a predetermined value during the lateral movement of the body in step (b).

4,177,586

YELLOWING RESISTANT LABEL COMPRISING A POROUS POLYAMIDE LAYER CONTAINING A PLASTICIZER

Shigeru Ogawa, Kyoto; Kenzi Uemura, Kameoka, and Masao Tanida, Kyoto, all of Japan, assignors to Dynic Corporation, Kyoto, Japan

Filed Aug. 31, 1977, Ser. No. 829,212
Claims priority, application Japan, Jun. 3, 1977, 52-65902
Int. Cl.[2] B05D *1/36;* B32B *5/24, 5/28, 31/24*
U.S. Cl. 40—2 R **8 Claims**

1. A label which is resistant to rubber-induced yellowing which comprises a fabric base containing a porous nylon resin layer formed on the surface thereof, said porous nylon resin layer being prepared by dissolving a nylon resin in a solution of

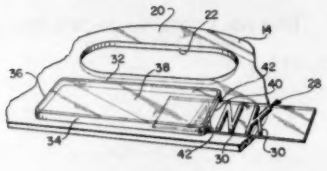
calcium chloride in methanol and adding thereto 7.5 to 17.5 PHR of a plasticizer selected from the group consisting of a carboxylic acid ester plasticizer and a sulfonamide plasticizer and dipping the nylon coated fabric base into water to leach out the methanol and calcium chloride to form said porous layer and drying the resultant composite.

4,177,587

NAME PLATE ASSEMBLY FOR TOTE BAG AND THE LIKE

Mac Dorsen, Scarsdale, and Philip A. Saltzman, Brooklyn, both of N.Y., assignors to Stupell Industries, Inc., Providence, R.I.

Filed Jul. 27, 1977, Ser. No. 819,682
Int. Cl.[2] G09F *3/20*
U.S. Cl. 40—16 **3 Claims**



1. An article having identifying indicia thereon, said article including means for releasably receiving an elongated generally thin material strip, said strip having a front face adapted for the receipt of marking indicia adhered thereto, said receiving means in turn attached to said article whereby a plurality of material strips may be alternatively received by said receiving means so as to modify the indicia of said article, said receiving means adapted to contact said strip at least at two longitudinally spaced locations thereof, said marking indicia positioned on said strip between said locations, said article receiving means comprising a substantially enclosed substantially rigid pocket outwardly projecting from said article, one side thereof open for receipt of said strip therein for underlying relationship with the outer face of said pocket, said outer face at least translucent so that at least the indicia on said strip is visible therethrough, said strip being flexible and having its opposed ends normally upwardly curled, said pocket having a top wall, a bottom wall, and a side wall, said walls outwardly extending from said article and connected to said outer face so as to space said outer face from said article, an (said) open side opposed to and longitudinally spaced from said side wall and defining a narrow slot for receipt of said strip said slot having a bottom portion adjacent said article, said slot being of sufficient width at said bottom portion for the uninterrupted receipt of said strip but narrower than the width of said strip at upper portions thereof whereby said normally upwardly bent portions of said strip end proximal said slot (will) abut said upper portions thereof so as to retain said strip within said pocket, said slot upper portions being formed by a pair of opposed bosses inwardly extending into said slot from top and bottom walls of said pocket.

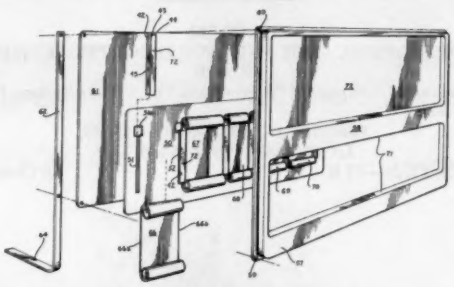
4,177,588

INDICATING DEVICE

James L. Gebhardt, Roswell, and Carlos L. Sanders, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 24, 1978, Ser. No. 899,360
Int. Cl.[2] G09F *11/21*
U.S. Cl. 40—16.4 **11 Claims**

1. An indicating device comprising a substantially flat base plate, an elongated slot formed in said base plate, a semirigid elongated rib having a central axial strut and a pair of parallel elongated rib mounting grooves formed in said rib, the length of said rib being substantially equal to the length of said slot, said grooves being disposed on opposite sides of said strut, said strut being of a width somewhat less than the width of said slot, and the width of said grooves being somewhat greater than the



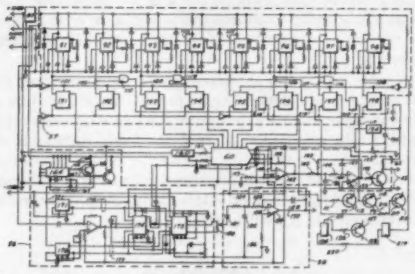
thickness of said base plate whereby said rib is slidable longitudinally in said slot with the edges thereof disposed in said grooves.

4,177,589

THREE-DIMENSIONAL ANIMATED FACIAL CONTROL

Alvaro J. Villa, Northridge, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Oct. 11, 1977, Ser. No. 841,002
Int. Cl.[2] G09F *27/00*
U.S. Cl. 40—457 **13 Claims**



1. An artifically animated figure comprising:
a replica of a face having three-dimensional facial features formed of a flexible material and having remotely actuable concealed means for manipulating the jaw, concealed means for rounding the mouth, concealed means for stretching the mouth and concealed means for drawing the lower lip inward relative to the upper lip, and
audio transducing means for generating an electrical signal of variable frequency components proportional to the frequency components of an audible input and coupled to said concealed means for actuating selected combinations of said concealed means as controlled by said electrical signal to produce animated movements of said facial features corresponding to facial movements of an individual originating said audio input.

4,177,590

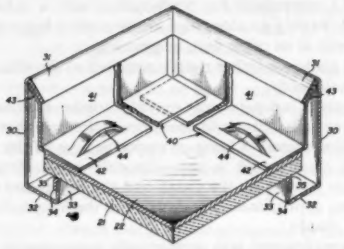
PICTURE FRAME ASSEMBLY

Lawrence P. Tushner, and Walter J. Krol, both of Chicago, Ill., assignors to Intercraft Industries Corporation, Chicago, Ill.

Filed Sep. 11, 1978, Ser. No. 941,002
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **15 Claims**

1. A frame assembly for displaying a picture or the like and comprising a frame having a pair of end frame members and a pair of side frame members, each of said frame members including an outside wall having a rear and a front, a rear wall on the rear of said outside wall and being inclined inwardly and forwardly therefrom, a front lip on the front of said outside wall and extending inwardly therefrom, and an inside wall on

the inside of said front lip and extending rearwardly therefrom, the rear of said inside wall being located forwardly of the front of said rear wall and defining a ledge for means including the picture; and at least two retaining strips respectively associated with two of said frame members, each of said retaining strips including a side wall having a front and a rear, a flange on the



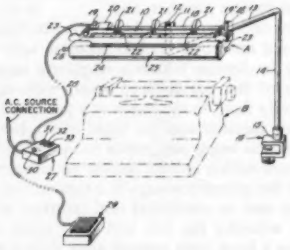
front of said side wall and extending inwardly therefrom, and a tongue on the rear of said side wall and being inclined outwardly and rearwardly therefrom, each of said retaining strips being applied by inserting its tongue in the space between the associated outside and rear walls and then pushing said retaining strip toward the associated outside wall until the associated flange rests on the rear of the means.

4,177,591

COPY HOLDER

John J. Thompson; Paul D. Gorman, both of New York, N.Y., and Patrick Dowd, Paramus, N.J., assignors to Pres-To-Line Corporation of America, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,161
Int. Cl.[2] B41J *11/36*
U.S. Cl. 40—343 **11 Claims**

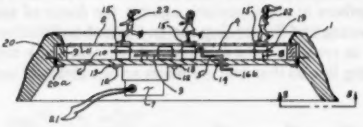


1. In a data-sheet handling copy holder for use as an adjunct to a typewriter or other operator-indexed data machine, the copy holder comprising a copy holder head, a platen having a shaft journaled in said head, pressure means carried by said head for coacting with the platen to hold a data sheet therebetween, and drive means for periodically incrementally advancing the angular position of said platen shaft, said drive means comprising a positive-displacement pulse-operated motor having an output shaft coupled to said platen shaft and producing an incremental angular output-shaft advance which is directly proportional to the time duration of an input control-pulse signal, and control means for said motor, said control means comprising pulse-generator means operatively connected to said motor for supplying a control-pulse signal of predetermined duration, the improvement wherein said control means includes selector-switch means providing a selected one of first and second selectively available control inputs to said pulse-generator means and respectively determining first and second control-pulse signal outputs of predetermined first and second time duration, and push-button means operative upon said generator means for initiating the production of a pulse of thus-selected duration.

4,177,592

MINIATURE ANIMATED DISPLAY

Mildred R. Ruck, Bethel Park, Pa., assignor to Ruck Engineering, Inc., Bethel Park, Pa.

Filed Oct. 26, 1977, Ser. No. 845,616
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—426 **10 Claims**

1. An animated display comprising:
a base;
a rigid member disposed within said base;
a first arm rotatably connected at one end to said rigid member;
a second arm, one end of said second arm rotatably connected to said rigid member and the other end of said second arm rotatably connected to said base;
rotating means for rotating said first arm fixed to one end of said first arm;
at least one plate magnet fixed to said rigid member such that at least a portion of said plate magnets extends above said rigid member;
a plate attached to said base above said plate magnets;
at least one animated figure;
at least one animated figure on the plate and above a plate magnet; said animated figure having a magnet attached to it such that when each of said figure magnets is placed on said plate in proximity to each of said plate magnets and said rotating means rotates said first arm, said figure magnets will become magnetically coupled to said plate magnets through said plate and said figures will be moved across said plate.

4,177,593

DEVICE HAVING INDICIA ANNOUNCING AN EVENT

James E. Lockey, 4912 Upton Ave. S., Minneapolis, Minn. 55410

Filed Feb. 1, 1978, Ser. No. 874,341
Int. Cl.[2] G09F *3/00, 23/06*
U.S. Cl. 40—488 **5 Claims**

1. A device for announcing an event comprising in combination:
(a) an edible item having letter indicia thereon which includes as part of the indicia the letters "SHE,"
(b) a walled sleeve having an opening in the wall thereof of a size which when positioned on the item exposes only the letters "SHE" of the indicia,
(c) said sleeve having complementary indicia adjacent said opening whereby the only indicia appearing relative to the item is the complementary indicia and the letters "SHE."

4,177,594

FISHING ROD ATTACHMENT

Chin K. Kim, Chicago, Ill., assignor to Bong K. Kim, Melrose Park, Ill., a part interest

Filed Mar. 16, 1978, Ser. No. 887,154
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—15 **8 Claims**

1. In a fishing device adapted to be attached to a fishing rod

having a fishing line connected at one end to the rod and at the other end to a fishhook, the combination comprising: an outer elongated member adapted to be attached toa fishing rod in parallel disposition thereto; an inner member movably mounted within said outer member; hook means mounted on said inner member and adapted to be attached releasably to the fishing line; main spring means for urging resiliently said members to an initial position; latching means for fixing releasably said members in a set position against the force of said main spring means and for freeing the two members relative to one another in response to a force applied to said hook means via the fishing line so that said members return abruptly under the

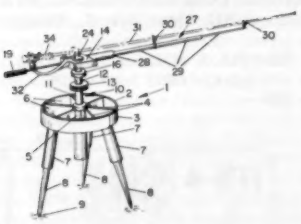
force of said main spring means to their initial position, thereby jerking on the fishing line to set the fishhook in place to catch a fish; wherein said hook means includes a tubular member having a backwardly inclined slot therein and having a spring loaded hook mounted on a block slidably mounted therein for receiving loosely an intermediate portion of the fishing line extending into the interior of said tubular member within said slot, push rod means for moving slidably said block to move said hook to a position out of alignment with said slot to enable the intermediate portion of the fishing line to be inserted into said slot and subsequently thereto when the force is applied to the line, to release the line from the fishing device.

4,177,595

PORTABLE FISHING ROD HOLDER AND STAND

Pyong H. Chon, 921 Citron - #2, Anaheim, Calif. 92805

Filed Jun. 27, 1978, Ser. No. 919,673
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 **9 Claims**



1. A fishing rod holder and stand for supporting in fishing position a fishing rod and reel comprising a circular tray with an upstanding side wall and a plurality of open compartments therein, removable spaced legs depending from said tray, a centrally disposed tubular hub in said tray having an upright tubular post removable therein, an inner post member sleeved within said post, adjusting means on said tubular post for preventing relative movement therebetween, a flat generally horizontal reel supporting plate formed with downwardly depending ring means, and circular boss means on said inner post member interfitting in said ring means, handle rod means projecting from said ring means for relatively and tiltably adjusting said ring and boss means, an elongated supporting pole mounted in and projecting forwardly from said flat plate, a rearwardly and upwardly extending U-shaped bracket means on said plate for receiving and supporting the handle end of a fishing rod, and spaced brackets on said elongated supporting pole for receiving and supporting the forward end of the fishing rod whereby the latter is supported in fishing position with the reel thereof supported by said reel supporting plate.

4,177,596

APPENDAGE FOR A FISHHOOK

John P. Dillow, 1906 Springbranch, Arlington, Tex.

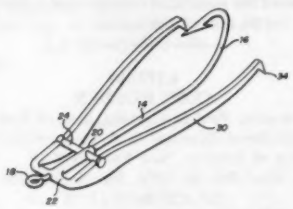
Filed Feb. 21, 1978, Ser. No. 879,243
Int. Cl.[2] A01K *83/02*
U.S. Cl. 43—36 **21 Claims**

18. An appendage for combination with a fishhook, said fishhook having an elongated shank with a bight at one end and an eye at its other end, comprising:

(a) an anchor member rigidly attached to the shank near the eye thereof;

(b) a pair of independently operable torsion members extending radially outwardly from the anchor member, with said torsion members lying on opposite sides of the shank and in a plane which is approximately perpendicular to the plane formed by the shank and the bight, and said plane being approximately transverse to the longitudinal axis of the shank;

(c) a cantilevered arm permanently connected to the distal end of each of the torsion members, and each arm having a relaxed position in which it forms a substantial angle with respect to the hook's shank at such time as its associated torsion member is relaxed, and each of said arms having a cocked position in which it is much closer to the



shank than in its relaxed position, with the cocked position of each arm being established by imparting torsion to its associated torsion member; and

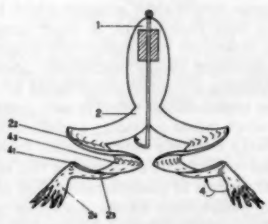
(d) means for temporarily holding individual ones of the two cantilevered arms in a cocked position, with said means including an element which is singularly associated with each one of the cantilevered arms, with each element being rigidly fixed to the shank at a position intermediate the torsion member and the bight of the hook, and said holding means being responsive to movement of a cantilevered arm within a fish's mouth for releasing said arm such that the potential energy in a torsion member may be recovered and an associated arm returned to its relaxed position, whereby the fish will have more difficulty in dislodging a hook with relaxed arms than it had in swallowing a hook with cocked arms.

4,177,597

FISHING LURE SIMULATING LIFELIKE MOVEMENT

Robert C. Thomassin, 20, rue Pasteur, Fontenay sous Bois, France

Filed Apr. 21, 1977, Ser. No. 789,692
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.3 **5 Claims**



1. A fishing lure capable of simulating the lifelike swimming motion of aquatic animals comprising:

a main body portion having an axis of symmetry;

at least two movable members formed of flexible, resilient material and projecting from said body;

each of said members comprising at least three rectilinear shaped segments, each of which has a width greater than its thickness, and all of the segments of each member being oriented so that in the initial non-swimming position of the lure, the segments all lie with their widths in the same plane and form angles with one another,

a first segment of each said member connected at one end to said body and extending at an acute angle away from a rearward extension of the axis of symmetry of said body,

a second segment of each said member connected at its one end to the other end of said first segment and extending towards the said rearward extension of the axis of symmetry at an acute angle with respect to said rearward extension;

a third segment of each said member connected to the other end of said second segment and extending forward toward said body in a direction substantially parallel with the said rearward extension of the axis of symmetry; and

said members, when the lure is placed in a body of water and subjected to the pull of a fishing line to which the lure is attached, exhibiting lifelike swimming motion of aquatic animals due to the action of a continuous stream of water caused by the pull of the lure through the water whereby the segments of each member resiliently deviate from their initial angled positions, thereby changing the angle between each segment and the relative position of the plane of each segment.

4,177,598

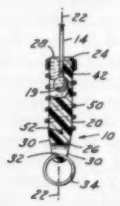
FISHING LURE HOOK UP SWIVEL

Kenneth A. Jolley, 9318 A Maryland St., Wurtsmith AFB, Mich. 48753

Filed Apr. 27, 1978, Ser. No. 900,341

Int. Cl.[2] A01K *91/04*

U.S. Cl. 43—42.49 **11 Claims**



1. A hook up swivel for coupling a ball-like element provided on one end of a fish line to a fish lure whereby the lure can rotate relative to the line, said hook up swivel comprising an elongated generally solid body which is of generally cylindrical configuration, said body having an axis and a pair of end portions, said body being made from a hard plastic material, said body having adjacent one end portion a generally flat surface through which said axis extends and which is perpendicular thereto, the other of said end portions having opposing flat tapered surface areas on opposite sides of said axis, an outwardly opening ball recess in said body which is spaced from said flat surface and intersects said axis, a bore provided in said body which extends from said flat surface along said axis to said recess, a slot in said body intersecting said bore throughout its length and also extending from said flat surface to said recess, said ball recess forming a receiver for the ball-like element and said slot forming an entrance to said bore for the fish line, an aperture extending through said body and said flat tapered surface areas, a ring-like element extending through said aperture and to which the fish lure is adapted to be attached, and closure means carried by said body and adapted for retaining the ball-like element and line in said recess and bore respectively to permit the fish lure to rotate relative to the line, said closure means being in the form of a retractable coil spring which is sleeved over said body and overlies said recess and said slot, said coil spring having one end anchored to said body, said spring being adapted to retain the ball-like element and the line in said recess and said bore respectively.

4,177,599

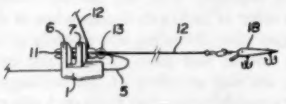
DOWNRIGGER RELEASE DEVICE

Alfred Pettersen, 345 Foul Bay Rd., Victoria, British Columbia, Canada

Filed Feb. 15, 1978, Ser. No. 878,185

Int. Cl.[2] A01K *91/00*

U.S. Cl. 43—43.12 **2 Claims**



1. A downrigger release device for use in deep water fishing with a downrigger line comprising an elongated body, a passage in said body for fixedly receiving a connecting line for connecting one end of the body to the downrigger line; a first arm extending outwardly from one side of the body; an aperture in said arm, the longitudinal axis of said aperture being substantially parallel to the longitudinal axis of the body; a pin releasably insertable into said aperture; a slot in one end of said pin for receiving a fishing line, whereby the fishing line is retained in said arm when the pin is inserted into said aperture, the fishing line being releasable from the body when force is applied to the fishing line; and connector means on the other end of said pin for attaching the pin to the connecting line and to the other end of said body, whereby the body, connecting line and pin form a single unit connected to the downrigger line.

4,177,600

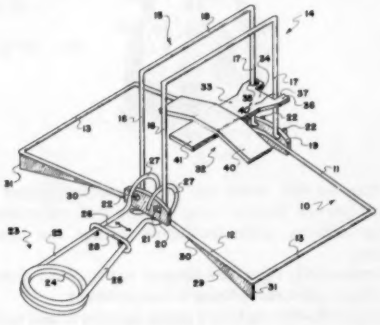
ANIMAL TRAP

Reino Torkko, P.O. Box 478, Longlac, Canada (P0T 2A0)

Filed Jan. 16, 1978, Ser. No. 869,607

Int. Cl.[2] A01M *23/30, 23/26*

U.S. Cl. 43—82 **6 Claims**



1. An animal trap comprising in combination a lower jaw assembly, an upper jaw assembly pivoted to said lower jaw assembly and movable from a set position substantially perpendicular to said lower jaw assembly, to a sprung position substantially superimposed upon said lower jaw assembly and vice versa, spring means operatively connected between said upper and lower jaw assemblies normally urging said upper jaw assembly towards the sprung position, and a trigger assembly for said upper jaw assembly, said trigger assembly maintaining said upper jaw assembly in the set position against the pressure of said spring means, when in the set position, and releasing said upper jaw assembly to the sprung position when disengaged from said upper jaw assembly, said upper jaw assembly including a pair of upper jaws each having lower ends and pivoted by said lower ends thereof substantially centrally of

said lower jaw assembly and lying in substantially spaced and parallel relationship when in said set position, each of said upper jaws comprising an open rectangular frame, each of said open rectangular frames constituting said upper jaws including a pair of spaced and parallel side members including outer ends and a transversely extending end member extending between the outer ends of said side members, said trigger assembly including a main, substantially rectangular, member loosely pivoted at one longitudinal side thereof and adjacent one end thereof, to one of said side members of one of said open frames, a lug formed on said one end of said main member of said trigger assembly on the other longitudinal side member thereof and detachably engaging with the corresponding one side member of the other of said open frames when in the set position, and a trigger plate extending downwardly at right angles from said one end of said main member and engaging the corresponding one side members of said rectangular frames, and a secondary member extending from each side of said main member of said trigger assembly intermediate the ends thereof and substantially at right angles thereto, said spring means urging said corresponding side member into detachable locking engagement with said lug.

4,177,601

FLOATED BAG TRAP

Roger H. Morton, 314 Sand Dune La., Holden Beach, Brunswick County, N.C. 28462

Filed Feb. 21, 1978, Ser. No. 879,249
Int. Cl.[2] A01K *69/06*
U.S. Cl. 43—102 **2 Claims**

1. A trap for fish, crabs and the like, characterized by a substantial portion thereof being flexible and collapsible for increasing capacity while facilitating storage and handling comprising:

(a) a substantially rigid base adapted to rest on an underwater floor, said base defining a compartment;

(b) buoyant flexible enclosure means secured to said base and communicatively cooperating with the compartment defined by said base when under water to form an enclosure of substantially greater volume than said compartment, said buoyant flexible enclosure means comprising a net and buoyancy means secured to said net;

(c) bait holding means carried by said base and disposed within the compartment thereof;

(d) entry means in said enclosure for entrance of fish, crabs and the like and comprising a muzzle carried by said base and a hole in said net communicatively cooperating with said muzzle; and

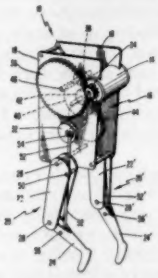
(e) trap location and retrieval means attached to said enclosure whereby the trap may be left under water and later retrieved.

4,177,602

AUTOMATED MECHANISM FOR IMPARTING MOVEMENT TO LIMBS OF A MECHANICAL TOY

Eun S. Choi, 315-503, Jamsil-3-dong, Gangnam-ku, Seoul, Rep. of Korea

Filed Jul. 26, 1978, Ser. No. 928,285
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—150 **7 Claims**



1. An automated mechanism for imparting life-like movement to limbs of a mechanical toy comprising:

(a) a motor;

(b) a gearbox;

(c) cam means rotatably mounted to the gearbox;

(d) gear mechanism rotatably mounted to the gearbox and operatively connected to the motor and cam means for rotatably moving the cam means in response to activation of the motor;

(e) at least a pair of limbs, each limb having a first member pivotally mounted to form joints at one end to the gearbox and at the other end to an opposing end of a second member;

(f) first and second fulcrum pins mounted at the said one end of each first limb member adjacent the gearbox and forming a space between said fulcrum pins;

(g) a connecting rod for each limb to impart movement thereto in response to rotation of the cam means, the rod having one end pivotally connected to the cam means and the other end to the second member at a distance from the joint formed with the first member, and wherein each rod is positioned for movement within the space formed between the first and second fulcum pins, the pins acting as fulcrums for the rod to transfer a predetermined movement to the second member when the rod engages the pins.

4,177,603

PLANT DESTRUCTION USING ELECTRICITY

Willis G. Dykes, Vicksburg, Miss., assignor to Lasco, Inc., Vicksburg, Miss.

Filed Dec. 8, 1977, Ser. No. 859,110
Int. Cl.[2] A01M *21/00*
U.S. Cl. 47—1.3 **28 Claims**

1. A machine for destroying plant growth around and between a pair of railroad tracks, said machine comprising:

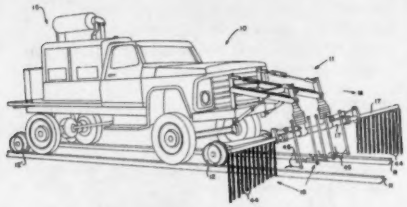
a vehicle having at least two sets of two wheels adapted to ride on said tracks, the wheels of each set electrically isolated from each other,

a source of high-voltage electricity mounted on and movable with said vehicle,

means for connecting said high-voltage source of electricity to ground, said means comprising one wheel of at least one of said wheel sets,

means for destroying plants around and between the railroad tracks, said means including a generally horizontally disposed rod mounted on said vehicle, plant contacting means operatively connected to said rod, and means for operatively electrically connecting said plant contacting

means to said high voltage source of electricity, said plant contacting means for transferring electricity from said



high voltage source to ground through plants contacted thereby.

4,177,604

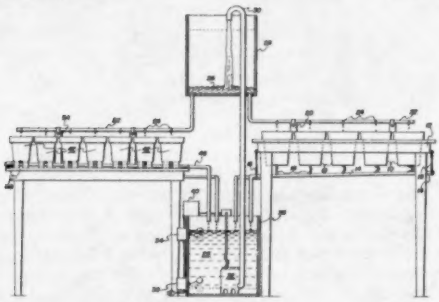
DRIP-ACTION HYDROPONIC GARDEN

David L. Friesen, 3667 35th St., San Diego, Calif. 92104

Filed Nov. 11, 1977, Ser. No. 850,779

Int. Cl.[2] A01G *31/00*; B67D *5/08*

U.S. Cl. 47—62 **2 Claims**



1. A hydroponic gardening system comprising:

(a) a plurality of plant pots, each having a central drain hole in the bottom thereof and being capable of holding root-engaging solids;

(b) said pots each having a fluid receiving port and a drain nipple projecting from the bottom thereof; said drain nipple end comprising a stub pipe having an orthogonally related collar on one end thereof, said pipe being inserted through the hole in said pot from the inside such that said collar seals same;

(c) a drip line operative to drip hydroponic liquid in said ports;

(d) a drain pipe having a plurality of openings to receive said drain nipples from said pots; and

(e) means to deliver liquid received by said drain pipe to said drip line.

4,177,605

DEVICE FOR DRIVING PANELS IN CONVEYANCE, ESPECIALLY HORIZONTALLY-SLIDING WINDOWS IN AN AUTOMOBILE

Robert Cherbourg, Rueil Entree Rnur; Jean-Pierre Falluel, Pierrelaye Entree Rnur, and Michel Ménard, Beynes Entree Rnur, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 22, 1978, Ser. No. 880,177

Claims priority, application France, Feb. 22, 1977, 77 05013

Int. Cl.[2] E05C *7/06*

U.S. Cl. 49—98 **7 Claims**

1. A device for driving sliding panels in a plane comprising:

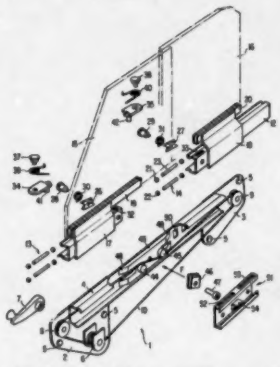
a pair of movable panels;

a fixed slide bar;

a carriage slidably disposed on the fixed slide bar;

a motor slide bar connected to the carriage and capable of sliding with the carriage on the slide bar;

a pair of supporrt slide bars slidably disposed on the fixed slide bar, each support bar having a latch selectively



engageable by said motor slide bar and independently supporting one of the panels for back and forth movement; and

crank means for driving the carriage to cause engagement of the motor slide bar with a latch of one of the support slide bars to drive the panel supported by the one of the support slide bars.

4,177,606

REGULATOR ASSEMBLIES

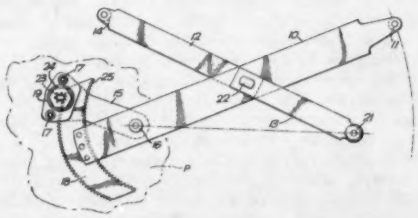
Philip S. Jeavons, and Sidney E. Fisher, both of Birmingham, England, assignors to Wilmot-Breeden Limited, Birmingham, England

Filed Aug. 31, 1977, Ser. No. 829,580

Claims priority, application United Kingdom, Aug. 31, 1976, 36041/76

Int. Cl.[2] E05F *11/44*

U.S. Cl. 49—351 **4 Claims**

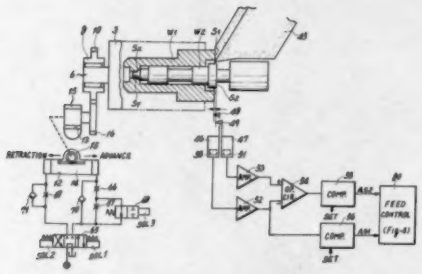


1. A vehicle window regulator assembly comprising two pivotally interconnected lifting arms acting between a window and a door panel of the vehicle in the manner of a scissors linkage, a panel plate attached to the door panel by a plurality of spaced fasteners one of which provides a pivotal interconnection between the panel plate and one of the lifting arms, a toothed segment carried by an end portion of said one lifting arm, which end portion is sandwiched between the panel plate and the door panel, and a pinion carried by the panel plate in mesh with the teeth of said segment whereby rotation of the pinion serves to effect pivotal movement of said lifting arm relative to the panel plate and thus, in use, opening or closing movement of the window.

4,177,607
END SURFACE MACHINING APPARATUS FOR A MATCHING WORKPIECE

Kikujiro Toda, Chita, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Feb. 1, 1978, Ser. No. 874,250
Claims priority, application Japan, Feb. 28, 1977, 52/21095
Int. Cl.[2] B24B *49/04*
U.S. Cl. 51—165 R **6 Claims**



1. An apparatus for machining an end surface of a first workpiece in a state that a second workpiece is inserted into said first workpiece and is axially positioned relative thereto with an engagement surface thereof being seated on a seat surface of said first workpiece, comprising:

a support member;

a work spindle rotatably carried on said support member for supporting said first and second workpieces;

a tool support for carrying a tool;

feed means for relatively moving said support member and said tool support toward and away from each other in an axial direction of said work spindle;

a first in-process gauge having a feeler engageable with said end surface to be machined of said first workpiece on said work spindle;

a second in-process gauge having a feeler engageable with a reference surface of said second workpiece on said work spindle, said reference surface being spaced from said engagement surface in said axial direction of said work spindle;

feed control means responsive to respective measurement output signals from said first and second in-process gauges for calculating the size difference of said end surface in process relative to said reference surface and for controlling said feed means upon the coincidence of said size difference with a set value being present therein;

a chuck provided on one end of said work spindle for clamping only said first workpiece on said work spindle;

contact establishing means for establishing a close contact of said engagement surface of said second workpiece with said seat surface of said first workpiece during measurement by said first and second in-process gauges, said chuck being operable independently of said contact establishing means for ensuring reliable clamping of said first workpiece.

4,177,608
FINISHING APPARATUS EMBODYING IMPROVED SEAL AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Jan. 16, 1978, Ser. No. 869,469
Int. Cl.[2] B24B *31/00*
U.S. Cl. 51—163.2 **26 Claims**

1. Apparatus for finishing parts or workpieces by attrition with loose, comminuted, granular, or particulate solid finishing material comprising relatively large finishing chips in the presence of a liquid vehicle, which includes:

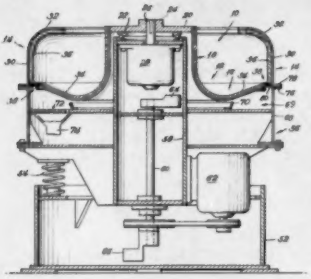
a finishing chamber having a containing surface comprising an outer upstanding wall and a bottom, said upstanding wall and said bottom being symmetrically arranged about a common axis and being relatively rotatable about said axis in order to impart motion to the contents of said chamber for finishing of said parts, and means for causing such relative motion,

characterized in that

said wall and said bottom have closely-spaced apposed surfaces and a resilient seal having corresponding apposed elements therebetween,

the apposed elements of said seal being in closely-spaced or touching relationship and

the surface of at least one of said apposed seal elements being irregular, thereby providing communication between said chamber and the exterior,



said irregular surface being adapted to impart a swirling or turbulent motion to the liquid vehicle passing through the seal by means of said surface irregularities, thereby retarding the rate of outflow of liquid vehicle from the finishing chamber so as to enable better cooling and cleansing of the finishing reaction mass during retention of the liquid vehicle within said finishing chamber, and better cooling and lubrication of the said sealing surfaces during travel of the liquid vehicle to the exterior upon being subjected to a sufficient liquid pressure head; and

said spacing and irregularities being of a size sufficient to permit flow from the interior to the exterior of said finishing chamber of liquid vehicle therein, including "fines" which may be entrained therein, when placed under a head of liquid pressure developed by means of said relative rotation of said upstanding wall and said bottom with respect to each other, but insufficient to permit passage to the exterior of said workpieces and finishing chips.

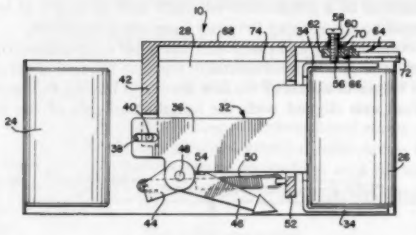
4,177,609
AUTOMATIC BELT CENTERING DEVICE

Stephanus J. Rameckers, Terheijden; Peter Wanninkhop, Breda, and Antonie J. Moolenaar, Dorst, all of Netherlands, assignors to Skil Corporation, Chicago, Ill.

Filed Jul. 12, 1978, Ser. No. 924,049
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB **10 Claims**

1. In an apparatus including spaced apart rolls, an adjustable mounting means for at least one roll, an endless belt positioned on the rolls, and drive means for the rolls and belt, the improvement comprising means for maintaining the belt in alignment relative to said rolls, the alignment means including a belt edge engaging means defining an engaging surface for engaging one belt edge, resilient means connected to said mounting means for applying a force tending to drive the mounting means in one direction, a support for said engaging means, and means operatively connecting said support and said mounting means whereby the force applied by said resilient means is transmitted to said support and associated engaging means, said resilient means thereby applying pressure to said engaging means to hold the engaging surface against said one belt edge

as the belt is moved by the drive means, said engaging means therefor following variations in the belt edge position, and the



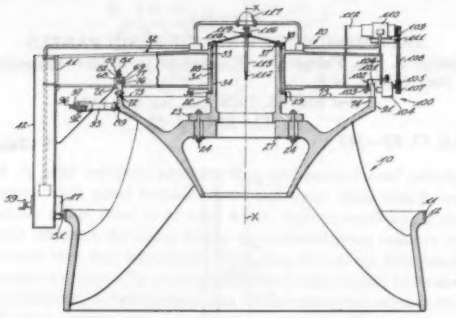
position of said mounting means therefor being adjusted in response to said variations to compensate for the variations.

4,177,610

APPARATUS FOR MACHINING LARGE HEAVY WORKPIECES IN SITUS

Kalman Farkas, Dover, and Gary A. Krebs, Mt. Wolf, both of Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 11, 1978, Ser. No. 904,766
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—241 S **4 Claims**



1. An apparatus for removing material from a metallic workpiece in which the workpiece is utilized as the support for the apparatus, said workpiece having

an axial bore and provided with a circular first portion and a circular second portion having an axial end surface and a circumferential side edge;

a bearing shaft having an axial bore secured to the workpiece with its axis coinciding with the axis of the workpiece;

a tool support beam having a hub from which first and second ends of said beam extend in opposite directions, said hub being provided with an axial bore which is adapted to be received by said bearing shaft in coaxial relationship;

a tool column secured to the said first extending end of said tool beam in depending relationship;

tool positioning means carried by the depending end of said tool column, said positioning means being movable in at least two mutually transverse paths of travel;

tool means carried by said tool positioning means for engagement with a portion of the workpiece from which metal is to be removed;

power drive means including a driving wheel carried on the second end of said tool support beam in position to engage on the axial end surface of the second portion of said workpiece to effect rotation of said tool support beam and thereby bodily movement of said tool means to effect the desired metal removing operation by said tool means on said workpiece;

an electric motor operably carried by said tool support beam; and,

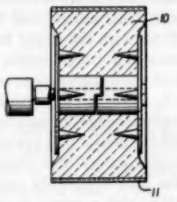
transmission drive means interconnecting said electric motor and said drive wheel to effect rotation of said drive wheel for rotating said tool support beam.

4,177,611

SANDING AND BUFFING ATTACHMENT FOR POWER TOOLS

Derrick Carr-Rollett, 28 Abbots Way, Auckland, New Zealand

Filed May 24, 1978, Ser. No. 909,052
Int. Cl.[2] B24D *9/00*
U.S. Cl. 51—376 **2 Claims**



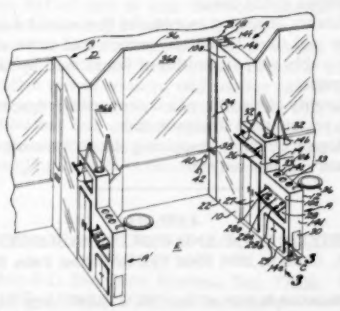
1. A sanding or buffing attachment for power tools including a section of resilient material having a circumferential surface, opposed inner and outer surfaces and a bore extending through said resilient material from said inner to said outer surface, abrasive or buffing material on said circumferential surface of said resilient material and a securing plate on each of said inner and outer surfaces of said resilient material, said securing plates each having a spindle section integral with the respective plate, said spindle sections extending into said bore in said resilient material, said spindle sections having stepped ends interengaging within said bore and said spindle sections further having aligned bores formed therethrough for accepting attachment means to engage the sanding or buffing attachment with a power tool chuck and said securing plates further having inwardly extending securing means engaging the resilient material and holding the plates and resilient material in position.

4,177,612

BEAUTY OPERATOR WALL STRUCTURE

Joe I. Tochihara, 4586 Everest Cir., Cypress, Calif. 90630

Filed Jul. 17, 1978, Ser. No. 925,221
Int. Cl.[2] E04H *3/00*
U.S. Cl. 52—28 **1 Claim**



1. In combination with a building that includes a floor and a plurality of walls extending upwardly therefrom in which the

business of a beauty salon is conducted, a plurality of longitudinally spaced vertical structural members secured to at least one of said walls and a plurality of longitudinally spaced horizontal structural members secured to said floor and lying in the same vertical plane as said vertical structural members, a plurality of pairs of prefabricated wall structures that removably engage a pair of said vertical and horizontal structual members to be supported thereby in vertical positions and normal to the one of said walls most adjacent thereto, said pair of wall structures when so disposed defining a space therebetween in which a chair for the support of a patron during the time that work is being performed on said patron by a beauty operator, each of said wall structures including:

a. first and second laterally spaced, parallel side walls, each of said side walls defining first, second and third rectangular panels of decreasing height;

b. a hollow frame assembly disposed between said first and second side walls and rigidly secured thereto, said frame assembly defining first, second and third horizontal surfaces that are flush with the upper horizontal surfaces of said first, second and third panels, a forward vertical surface flush with forward vertical edges of said first and second side wall, a horizontal portion upwardly disposed from lower horizontal edges of said first, second, and third vertical rectangular panels and cooperating therewith to define a horizontal recess that removably engages said horizontal recess that removably engages said horizontal structual member, and a vertical portion inwardly disposed from the free vertical edges of said first rectangular panels and cooperating therewith to define a vertical recess in which said vertical structual member is disposed;

c. first means for removably securing said wall structure to said vertical and horizontal structural members when the latter are disposed within said vertical and horizontal recesses, said first means cooperating with said vertical and horizontal structural members to maintain said wall structure at a fixed position relative to said floor and said wall most adjacent said wall structure;

d. a first mirror secured to said first rectangular panel of said first side wall;

e. electrically energized light means secured to said first rectangular end of said first side wall and adjacently disposed to said mirror;

f. a second mirror that extends between said pair of wall structures and is adjacently disposed to said wall of said building most adjacent said pair of wall structures;

g. first movable drawer means in said second panel of said first side wall for removably holding accessories of said beauty operator;

h. second movable drawer means in said third panel of said first side wall for removably holding an electrically operated hair dryer and hair curling irons;

i. third movable drawer means in said wall structure for receiving soiled linens;

j. a plurality of spaced receptacles that extend downwardly from said third horizontal surface that serve as wells to removably support bottles of liquid used by said beauty operator;

k. a plurality of electric outlets supported in spaced relationship on said wall structure; and

l. an electric circuit for supplying electric power to said light means and said outlets.

4,177,613

UNITIZED ROOF AND CEILING SUBASSEMBLY

Joseph A. Czeiner, 2594 West End Rd., West Palm Beach, Fla. 33406

Continuation-in-part of Ser. No. 174,060, Aug. 23, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 460,088

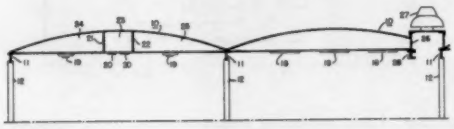
Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—86 **7 Claims**

1. A unitized and prefabricated prestressed combination roof and ceiling assembly adapted to be supported, in situs, between supporting members comprising:

a first relatively thin continuous flat sheet of uniplanar rigid material of a predetermined width and of length at least equal to the spacing between supporting members,

a second initially and essentially flat sheet of uniplanar rigid material of width substantially equal to the first sheet and of length in excess of the first sheet and having its longitudinal axis aligned with the longitudinal axis of the first



sheet, said second sheet being bowed by pre-stressed compression into a shallow arc of chord length equal to the length of the first sheet, and

fastening means innerconnecting together the ends of the first and second sheets to form a prefabricated and unitized assembly and to maintain the second sheet in compression forming an arched and prestressed roof deck and the first sheet in tension forming the ceiling of a structure when the assembly is in position between the supporting members.

4,177,614

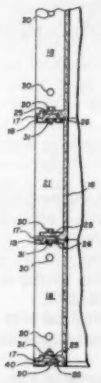
SWIMMING POOL WALL OF RESIN PANELS

George F. Arp, Fairport, N.Y., assignor to Heldor Associates, Inc., Clifton, N.J.

Filed May 15, 1978, Ser. No. 905,640

Int. Cl.[2] E04H *3/18*

U.S. Cl. 52—247 **9 Claims**



1. A swimming pool wall formed of a plurality of interconnected panels of resin material, each of said panels having an inward facing wall and a flange extending outward from said inward facing wall along top, bottom, and end edges of said panels, and said pool wall comprising:

a. each of said panels extending longitudinally of said pool wall for a substantial distance and extending upward for only a portion of the height of said pool wall with said pool wall being formed of at least three tiers of said panels;

b. said flanges at said bottom and top edges of said panels being formed with mating tongues and grooves extending along the length of each of said panels to interlock said tiers of said panels;

c. means for connecting together said flanges at said bottom and top edges between said tiers of said panels to hold said tongues and grooves together in said interlock;

d. means for connecting together said flanges at said end edges of longitudinally adjacent ones of said panels, so that end edge joints between said panels in one of said tiers are arranged in a central region of one of said panels in an adjacent tier;

e. means for fitting into tongue and groove relationship with the lowermost of said bottom edge flanges and extending across said end edge joints of the lowermost one of said tiers; and

f. each of said panels having a predetermined shape so that said substantial longitudinal extent of said panels in said interlocked tiers cooperates to conform each of said panels accurately to a predetermined configuration of said pool wall.

4,177,615

FASTENING DEVICE FOR ROOF PANEL JOINTS

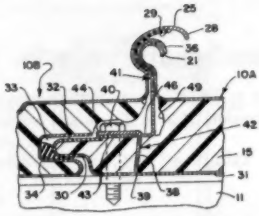
John W. Anderson, Bradford Woods, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Aug. 9, 1978, Ser. No. 932,333

Claims priority, application Spain, Aug. 27, 1977, 230.787[U]

Int. Cl.[2] E04B *7/00;* **E04C** *1/30;* **E04D** *3/362, 3/364*

U.S. Cl. 52—478 **9 Claims**



1. A joint between adjacent first and second roof panels, wherein each panel includes inner and outer skins which are laterally offset relative to each other, and an insulating core which connects the outer skin in shear-transferring relation to the inner skin, and wherein the insulating core of the first panel provides an upwardly presented exposed core surface between corresponding longitudinal edges of the outer and inner skins, said joint comprising interfitted connectors formed along upper edges of upstanding sidewalls of the outer skins and positively connecting said first roof panel to said second roof panel; a fastening device having an upper end confined within said interfitted connectors, a base extending laterally of said upper end overlying said exposed core surface, and a flange extending downwardly through said insulating core and presenting a lower end adjacent to said inner skin; and a fastener extending through said base, said insulating core and said inner skin securing said adjacent roof panels to a structural member.

4,177,616

INSULATED FURNACE STRUCTURE

Albert J. Lampert, 605 Avenue Teresa, San Clemente, Calif. 92676

Continuation-in-part of Ser. No. 777,059, Mar. 14, 1977, Pat. No. 4,083,155. This application Sep. 14, 1977, Ser. No. 833,176

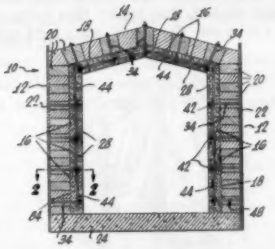
Int. Cl.[2] E04B *1/80*

U.S. Cl. 52—509 **8 Claims**

1. A thermal enclosure for use as a furnace comprising:

a plurality of structural walls of refractory brick;

a plurality of discrete, non-structural, soft, pliant pads arranged adjacent to each other according to a predetermined pattern to form a continuous insulating layer over the interior surface of said walls, each of said pads being formed throughout by a pliant, low density material made of a single, undivided and uninterrupted mass of randomly interwoven ceramic fibers, and each of said pads having mutually interlocking V-shaped ends; and



hanger means projecting inwardly from said walls for maintaining said pads in an overlying relationship with respect to said walls.

4,177,617

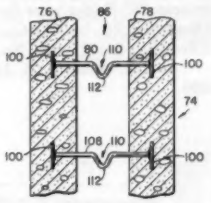
THERMAL BLOCK

Anthony DeLuca, and Josephine DeLuca, both of 8900 W. Sample Rd. #107, Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 801,093, May 27, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 849,105

Int. Cl.[2] E04B *2/28*

U.S. Cl. 52—562 **9 Claims**



1. A building wall comprising:

a block, said block having a lateral surface,

a plate, said plate disposed secured within said block, said lateral surface having an opening therein communicating with said plate,

at least one rod, a portion of the length of said at least one rod having means for causing water condensate to concentrate at a point along the length of said at least one rod, located outwardly from said lateral surface when said at least one rod is disposed secured to said plate, means to secure one end of said at least one rod to said plate having said one end of said at least one rod disposed passing through said opening in said lateral surface,

a pair of washer like elements, said pair of washer like elements being disposed at said one end of said at least one rod, another pair of washers, said another pair of washers disposed at the other end of said at least one rod, said pair of washers and said another pair of washers disposed in spaced-apart relationship secured to said at least one rod and extending radially outwardly therefrom.

4,177,618

METHOD AND APPARATUS FOR INSTALLING INSULATION

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

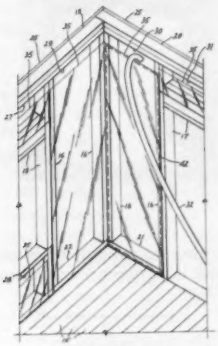
Filed Feb. 6, 1978, Ser. No. 875,410

Int. Cl.[2] E04B *1/74*

U.S. Cl. 52—743 **10 Claims**

1. Method for installing loose insulation in a space enclosed vertically therearound except at one side and enclosed at its

bottom, comprising covering said one side of said space with a sheet of plastic film to support insulation in said space and to form a vapor barrier, said plastic film being temporarily supported by a movable flat shield plate held against said plastic



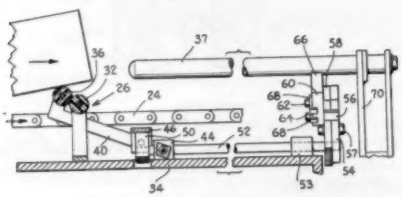
film at the outer side thereof and extending completely across at least one transverse dimension of said space, and delivering loose insulation into said space behind said sheet of plastic film, and leaving said sheet of plastic film in place to provide a permanent vapor barrier at one side of said insulation.

4,177,619

CASE INDEXING APPARATUS

Thomas P. Hartness, 305 Bridgewater Dr., and Robert G. Hartness, 203 Wilmington Rd., both of Greenville, S.C. 29615

Filed Oct. 6, 1977, Ser. No. 839,798
Int. Cl.[2] B65B *5/06, 21/16*
U.S. Cl. 53—250 **3 Claims**



1. An apparatus for indexing an empty case into an article loading machine from a conveyor feeding a continuous line of empty cases positioned adjacent one side of said article loading machine, said article loading machine including an elevator platform which raises an empty case to a loading position wherein said articles are deposited therein, said apparatus comprising:

rake means for shifting said first empty case from a first position on said conveyor onto said elevator platform including,

a rake,

a fluid operated cylinder connected to said rake,

means for activating said fluid operated cylinder connected to said rake upon a case being shifted into said first position causing said rake to shift said case onto said platform,

cam means engaging the next following case carried on said conveyor preventing said next following case from being shifted forward while said first empty case is being shifted onto said elevator platform,

means deactivating said cam means allowing said next following case to be shifted by said conveyor to said first position after said first empty case has been shifted onto said elevator,

said cam means including,

(i) an abutment carried in the path of said empty cases for engaging a front end of said next following case preventing said case from being shifted forward on said conveyor,

said means for deactivating said cam means includes,

(i) a post,

(ii) means for selectively raising said post to engage the bottom of said next following case adjacent a front end thereof for lifting said front end above said abutment, and

said means for selectively raising said post including,

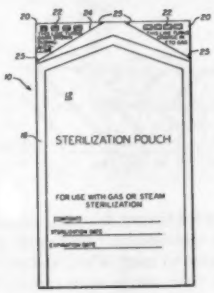
(i) a rotatable cam means engaging said post for raising said post upon being rotated lifting said front end of said next following case above said abutment.

4,177,620

METHOD OF FORMING A STERILIZABLE PACKAGE WITH TEAR-OFF INDICATORS

William P. Daly, White Plains, N.Y.; Robert P. Lewis, Oceanport, and Oliver L. Pouliot, Oradell, both of N.J., assignors to Faser Industries, Saddle Brook, N.J.

Division of Ser. No. 780,399, Mar. 23, 1977, Pat. No. 4,121,714.
This application May 10, 1978, Ser. No. 904,671
Int. Cl.[2] B65B *55/02*
U.S. Cl. 53—425 **2 Claims**



1. Method for sterilizing which comprises providing an open-ended package made of a plastic member heat sealed to a paper member, the paper member having a portion extending beyond the area to be enclosed by the heat seal when completed, said portion bearing indicia that changes color upon sterilization, inserting the item to be sterilized into the open-ended package, separating the indicia bearing portion from the package and inserting said separated portion into the package with the indicia visible through the plastic member, heat sealing the open end of the package and subjecting the sealed package to sterilization.

4,177,621

AUTOMATIC FRUIT BAGGING

Harry C. Powell, Jr., Faber, Va., assignor to Powell Machinery, Inc., Faber, Va.

Filed May 11, 1978, Ser. No. 905,173
Int. Cl.[2] B65B *1/32*
U.S. Cl. 53—468 **41 Claims**

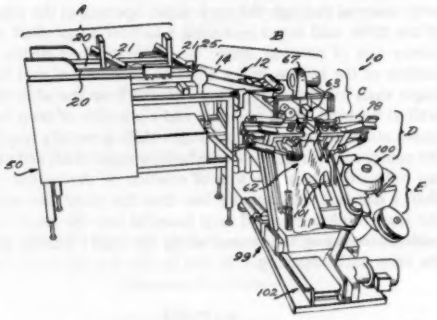
1. A method of bagging bruisable discrete articles utilizing a weighing mechanism, comprising the steps of

(a) feeding the articles single file to the weighing mechanism,

(b) terminating feeding of the articles to the weighing mechanism just short of a predetermined desired weight of articles,

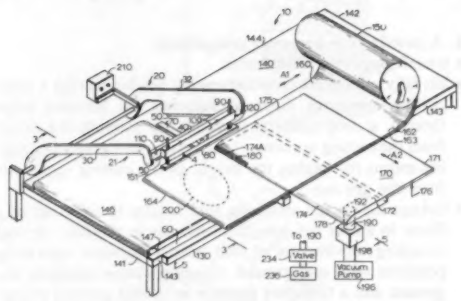
(c) allowing the weighing mechanism to reach equilibrium and then weighing the articles in the weighing mechanism and comparing the weight of articles to the predetermined desired weight,

(d) if the weight is equal to or greater than the predetermined desired weight, emptying the weighing mechanism,
(e) if the weight is less than the predetermined desired weight, reinstituting feeding until another single article is fed to the weighing mechanism, and



(f) terminating feeding to the weighing mechanism after the single another article is fed, and then repeating steps (c) and (e) until the conditions in step (d) are met.

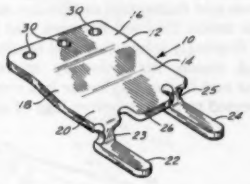
4,177,622
BAG SEALING APPARATUS WITH BAG EVACUATION MEANS
Martin Siegel, Englewood Cliffs; Eugene Millevoi, Fort Lee, and Boleslaw L. Budzyn, Passaic, all of N.J., assignors to Weldotron Corporation, Piscataway, N.J.
Filed Jun. 7, 1978, Ser. No. 913,522
Int. Cl.[2] B65B *31/04*
U.S. Cl. 53—511 **11 Claims**



1. Apparatus for forming a packaged product comprising
a supply of bag-forming film,
first means for forming an open-ended bag from said film,
second means coupled to the open end of said bag for evacuating said bag,
third means for sealing the open end of said bag,
said second means comprising a chamber disposed across the open end of said bag and having a front end which faces the inside of said bag, said front end including an apertured portion and an adjacent unapertured portion, and
fourth means blocking a portion of said apertured portion.

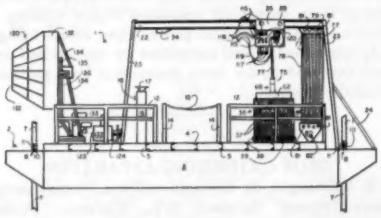
4,177,623
STIRRUP STRAP FASTENER
Wayne W. Perry, 10641 W. 104th Pl., Broomfield, Colo. 80020
Filed Mar. 20, 1978, Ser. No. 888,369
Int. Cl.[2] A44B *11/22*
U.S. Cl. 24—176 **4 Claims**

1. Fastener means releasably joining straps together comprising:
a metal plate having a pair of spaced bends to produce spaced apart, parallel, planar land areas offset from each other at least the thickness of the straps and spaced apart by a sloped land between the spaced lands, a first of said parallel areas having a plurality of holes for permanently securing said plate to strap means;
a pair of spaced apart prongs extending outwardly from the second said planar land area directed away from said first land area with said holes, and said prongs being offset



from said second adjacent land area by neck portions of a length of the general thickness of a strap to be fastened, and outer planar ends of said prongs being generally parallel to said second land area; and
a land extension parallel with and extending from said second land area between said spaced apart prongs, and extending beyond said neck portions and of a length substantially less than said prongs.

4,177,624
AQUATIC PLANT SAMPLER
Thomas G. Kelpin, 8877 Bayonne Dr., Shreveport, La. 71108
Filed Oct. 6, 1977, Ser. No. 840,095
Int. Cl.[2] A01D *44/00*
U.S. Cl. 56—9 **20 Claims**



1. An aquatic plant sampler comprising:
(a) an aquatic craft; and
(b) a sampling bucket carried by said aquatic craft for lowering into the water of a water body floating said aquatic craft and collecting plant and water bottom samples, said sampling bucket further comprising rotating cutter means for isolating said samples and bottom retracting means internally provided in said sampling bucket above said cutter means for receiving and holding said samples.

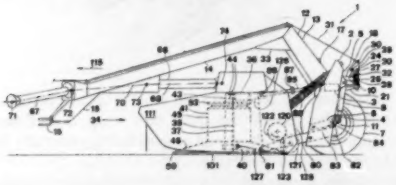
4,177,625
PULL-TYPE AGRICULTURAL MACHINE
Andrew C. Knight, Dunstable, and Nigel W. Meek, Aylesbury, both of England, assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Mar. 27, 1978, Ser. No. 890,091
Claims priority, application United Kingdom, Apr. 5, 1977, 14224/77
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—13.6 **9 Claims**

6. A harvesting machine comprising:
a mobile frame adapted for movement across the field, said

frame having an upper transverse beam and legs projecting downwardly from the respective ends of said upper beam;

a crop harvesting header movably affixed forward of said frame, said header including a plurality of drum type cutter means for severing the crop from the ground and an elongated rotary crop conditioning means rearward of said drum type cutter means for conditioning the severed crop;

a header suspension means for floatingly supporting said header from said frame, said suspension means including a spring-like means disposed between said header and said frame for floatingly supporting said header and upper and lower link means for pivotably interconnecting said header and said frame, said lower link means being pivotally connected to the respective legs of said frame;



an arched drawbar pivotally attached to said frame and being pivotable over said header to move said machine between an operative position and a transport position;

lifting means operable with said lower link means for moving said frame relative to the ground and said header relative to said frame such that the distance between the header and the ground when the header is in the raised transport position is greater than the distance between the header and arched drawbar when the header is in the lowered operative position; and

drive means for rotating said drum type cutter means and said conditioning means, said drive means including a power input means for receiving rotary driving power from a prime mover, said power input means being rotatably journalled in and supported by said arched drawbar such that said power input means is at least partially substantially horizontal.

4,177,626

CROP GATHERING APPARATUS

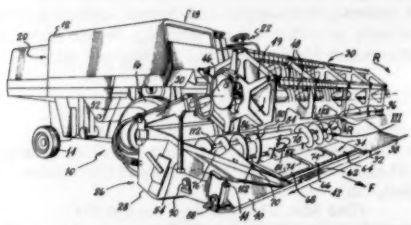
James B. McNaught, St. Germain-en-Laye, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 17, 1978, Ser. No. 896,667

Claims priority, application United Kingdom, Apr. 21, 1977, 16714/77; May 11, 1977, 19694/77

Int. Cl.[2] A01D *45/00*

U.S. Cl. 56—14.5 **4 Claims**



1. A combine harvester crop gathering table including an upper rear table support beam, a table floor the upper surface of which forms an auger trough, a rear wall connected to the table support beam and to the table floor, an end wall at each end of the table secured to the upper rear table support beam the table floor and the rear wall, a cutterbar assembly mounted on the forward portion of the crop gathering table and extending from one end wall to the other end wall, a crop outlet opening in the rear wall, and an auger **36** rotatably journaled on the two end walls for receiving crop material, for conveying crop material along the auger trough and for conveying crop material through the crop outlet opening in the rear wall of the table, said auger including a hollow auger shaft with a center axis of rotation, auger flighting attached to the outer surface of the hollow auger shaft on each end of said hollow auger shaft for conveying crop material from the adjacent end wall to the crop outlet opening, and a plurality of crop feeding plates attached to the hollow auger shaft generally parallel to the center axis of rotation of the hollow auger shaft and extending outwardly from the axis of rotation of the hollow auger shaft a distance substantially less than the outer free edges of the auger flighting to pull crop material into the auger trough without impeding movement along the auger trough toward the crop outlet opening.

4,177,627

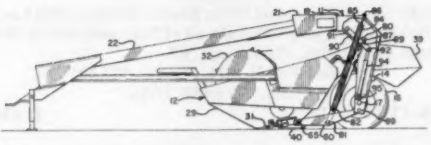
HEADER SUSPENSION

George B. Cicci, Burr Ridge, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 12, 1978, Ser. No. 914,321

Int. Cl.[2] A01D *47/00*

U.S. Cl. 56—15.8 **13 Claims**



1. A mobile crop harvester comprising:

a wheel supported main frame;

a laterally elongated crop harvesting header having a crop cutting apparatus disposed adjacent the forward edge thereof, a crop conveying means for moving the crops from the cutting apparatus rearwardly, and ground engaging means for gaging the height of the cutting apparatus from the ground;

a linkage means for attaching said header to said carrying frame in a four bar nonplanar linkage to provide vertical swinging movements of said header between operating positions with said ground engaging means engaging the ground and a transport position with said ground engaging means raised, said linkage means being so disposed and of such relative lengths that when said header is in the operating position, the instant center of movement of said header relative to said frame is rearward of said header but relatively closely adjacent to said harvester and upon movement of said header toward said transport position, said instant center moves rearwardly toward infinity.

4,177,628

HILLSIDE ATTACHMENT FOR COMBINES

Harold H. Brandt, Garnavillo, Iowa 52049

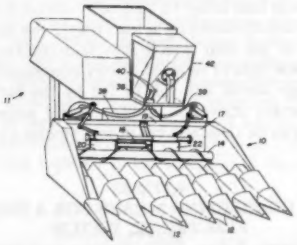
Filed Dec. 27, 1977, Ser. No. 864,199

Int. Cl.[2] A01D *35/28*

U.S. Cl. 56—209 **10 Claims**

1. For use in a harvesting machine or combine having a grain gathering and harvesting unit, a threshing unit rearwardly of said harvesting unit, and feeding means for transporting the grain collected by the harvesting unit to the threshing unit through a grain intake opening, control means for more evenly distributing the grain collected by the harvesting unit when said combine operates on a side hill, said control means com-

prising regulating means located between said harvesting unit and said threshing unit to selectively direct a greater amount of



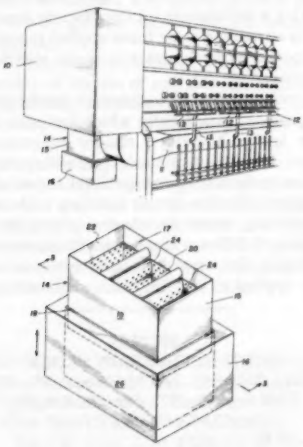
grain discharged from the harvesting unit through said intake opening to a selected side of said threshing unit.

4,177,629

TUNABLE NOISE SUPPRESSION SYSTEM FOR SPINNING MACHINE FIBER COLLECTOR UNITS

Harry R. Kennedy, Greer, S.C., assignor to Seabrook, Inc., Anderson, S.C.

Filed Jun. 23, 1978, Ser. No. 918,573
Int. Cl.[2] D01H *11/00*; G10K *11/02*
U.S. Cl. 57—1 R **7 Claims**



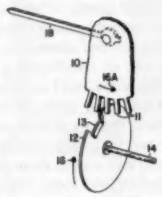
1. In a textile machine of the class having a pneumatic loose fiber collection system including a loose fiber collection box having an exhaust outlet, the combination with said loose fiber collection box of an exhaust noise suppression device mounted in communication with said exhaust outlet and including at least a pair of interfitting sections which are adjustable one relative to the other so that said device can be tuned to suppress predominant noise frequencies, said interfitting sections being sleeve-like and being telescopically engaged, a resilient gasket disposed between said telescoping sections of the device to form an air seal therebetween and to also form a frictional connection between said sections whereby they will remain in selected adjusted positions, and each of said telescoping sleeve-like sections being double-walled with the inner wall thereof perforated, and acoustical insulating material filling the spaces of said sections between their inner and outer walls.

4,177,630

SWEEP SECONDS TO JUMP SECONDS CONVERSION FOR CLOCKS

Frank H. Marz, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 25, 1977, Ser. No. 845,018
Int. Cl.[2] G04B *13/00*
U.S. Cl. 58—7 **12 Claims**



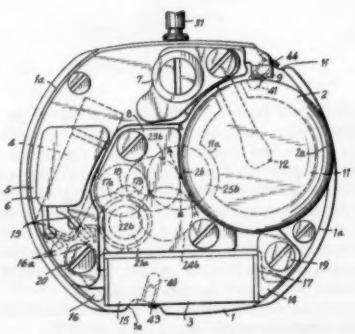
1. In a timing mechanism for a clock, a jump seconds indicator comprising an impulse wheel having a plurality of teeth, and drive means coupled to said impulse wheel for advancing said impulse wheel, said drive means comprising a conversion wheel having means located thereon for advancing said impulse wheel by both indexing one tooth of said plurality of teeth by contact therewith and engaging the next adjacent tooth of said plurality of teeth prior to indexing it, and means for substantially uniformly and unidirectionally rotating said conversion wheel.

4,177,631

SMALL-SIZED QUARTZ CRYSTAL WRISTWATCH

Haruyoshi Yamada, and Kenichi Ushikoshi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,723
Claims priority, application Japan, Apr. 26, 1976, 51-47031
Int. Cl.[2] G04B *13/02, 19/02*; G04C *3/00*
U.S. Cl. 58—23 BA **20 Claims**



1. An electronic wristwatch comprising support means, a battery means disposed on said support means, quartz crystal oscillator means, said quartz crystal oscillator means including a quartz crystal vibrator, said quartz crystal vibrator being formed by photo-etching, and a cylindrical case, said quartz crystal vibrator being disposed in said cylindrical case, said quartz crystal oscillator means being disposed on said support means and coupled to said battery means for producing a high frequency time standard signal, divider means disposed on said support means and coupled to said oscillator means for dividing a high frequency time standard signal produced by said oscillator means and in response thereto producing a low frequency timekeeping signal, and electro-mechanical transducer means disposed on said support means for receiving said

low frequency timekeeping signal and in response thereto being continuously incrementally rotated, a center wheel rotatably disposed on said supporting means, and a gear train disposed intermediate said electro-mechanical transducer means and said center wheel for transmitting to said center wheel a predetermined amount of rotation in response to each incremental rotation of said electro-mechanical transducer means, said support means including a support plate constructed and arranged to position said battery so that the periphery thereof is disposed proximate to said center wheel, so that said battery means is disposed in overlapping relationship with said center wheel in plan view, and is further constructed and arranged to position said gear train out of overlapping relationshi with said battery means in plan view, said support plate being further adapted to position said gear train on the opposite side of an imaginary line from said battery means, said imaginary line intersecting said center wheel at a position substantially tangent to said battery means, and a stem disposed on said support means, the axial direction of said stem being disposed in substantial alignment with a further imaginary line intersecting said center wheel, said further imaginary line being disposed at a position substantially tangent to said battery means.

4,177,632
ELECTRONIC WATCH

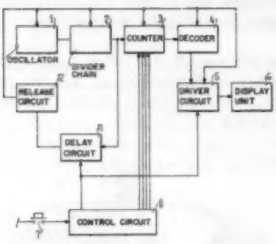
Jean-Jacques Bürki, St. Blaise; Hans G. Dill, and Kurt Hübner, both of Neuchatel, all of Switzerland, assignors to Ebauches Electroniques S.A., Marin, Switzerland

Filed Jul. 8, 1977, Ser. No. 814,107

Claims priority, application Switzerland, Jul. 16, 1976, 9126/76

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 BA **5 Claims**



1. An electronic watch adapted to be powered by at least one feeding battery and having an oscillator circuit, a frequency divider chain connected to said oscillator circuit, counter means connected to an output of said frequency divider chain for selecting a desired one function of at least two functions of said watch, decoder means connected to an output of said counter for decoding the output signal therefrom; a display means, and an interface means connected between said display means and said decoder means for the control of said display means; said watch further comprising

a delay circuit connected to the output of said frequency divider chain for producing a time delay T_o;

a logic circuit connected to said delay circuit and having at least three serial, shiftable stages, each stage having an output corresponding to a possible function of said watch, one of said stages corresponding to a stocking condition;

and a control means for controlling the sequential shifting between said logic circuit stages and thus for controlling the function to be displayed by said display means;

said delay circuit being activated and said display means being visably deactivated by the logic circuit so as to indicate immediately that the logic circuit is in said stocking condition when first placed therein such that the output of said delay circuit remains unchanged until the end of said time T_o and the time counting is not lost when if before the end of said time delay T_o said logic circuit is switched out of the stocking position, such as when during the selection of the functions of said watch said logic circuit is shifted from one condition to another through the intermediate stocking condition, and such that at the end of said time delay T_o, said delay circuit is capable of at least indirectly disabling at least part of the circuits of said watch to put said watch into said stocking condition which is a state of reduced energy consumption in which said logic circuit can still be fed by the battery so that upon further activation of said control means said logic circuit can be switched out of said stocking condition.

4,177,633
TIME CORRECTING MEANS FOR A DIGITAL ELECTRONIC WATCH

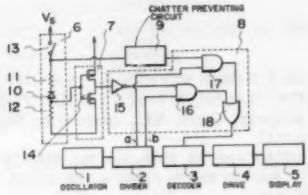
Masao Miyamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 3, 1978, Ser. No. 921,234

Claims priority, application Japan, Jul. 20, 1977, 52-87108

Int. Cl.[2] G04C *3/00;* **G04B** *27/00;* **H01L** *29/84*

U.S. Cl. 58—23 R **6 Claims**



1. Time correcting means for a digital electronic watch of the type having a decoder circuit for effecting time correction in response to correcting pulse trains applied thereto when the watch is placed in its time correcting mode, said time correcting means comprising:

switching means including a distortion semiconductor having a resistive characteristic which varies in response to pressure applied thereto; a resistor connected in series with said distortion semiconductor; voltage level detecting means to detect the voltage level across said resistor; and a signal selective circuit coacting with said voltage level detecting means to selectively transfer correcting pulse trains of different frequencies to said decoder circuit for changing the time correcting speed in response to pressure applied to said distortion semiconductor.

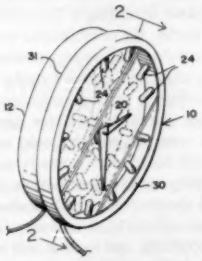
4,177,634
MULTI-REFLECTION CLOCK

Miguel Calienes, 8370 SW. 39th St., Miami, Fla. 33155

Filed Sep. 20, 1977, Ser. No. 834,846

Int. Cl.[2] G04B *19/30, 19/06*

U.S. Cl. 58—50 R **2 Claims**



1. A multi-reflection clock comprising a housing, a one way mirror mounted in said housing, said mirror having a reflecting

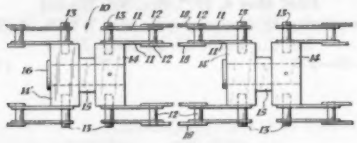
surface positioned on the rear surface thereof, clock means mounted on said mirror and having minute and hour hands positioned before said front surface of said mirror, a two way mirror mounted on said housing adjacent to and in spaced relation to said front surface of said one way mirror, said one way mirror being convex in shape facing in the direction of said two way mirror and light producing means mounted on said housing whereby substantially innumerable images representing the numerals of a clock are reflected between said mirrors and an observer viewing said clock will see said images symmetrically disposed about said clock, in arcuate alignment and converging together in the direction of the rear of said clock.

4,177,635

SWIVEL LINK FOR A DUAL CHAIN CONVEYOR

Frank Klimezky, 3581 S. Ocean Blvd., South Palm Beach, Fla. 33460

Filed Sep. 5, 1978, Ser. No. 939,673
Int. Cl.[2] F16G *13/06;* B65G *17/00*
U.S. Cl. 59—78 **1 Claim**



1. In a dual chain conveyor of the endless type having a plurality of predetermined lengths of first chains and second chains mounted in laterally and axial alignment relationship and each of said lengths having leading and tailing ends; an adaptor comprising

a first rigid body mounted between leading ends of each of said plurality of lengths of said first and second chains;

a second rigid body mounted between the trailing ends of each of said plurality of lengths of said first and second chains;

a swivel pin connecting each said first and second body of adjacent chain lengths allowing relative rotational movement between said first and second body, and a spacer positioned between each said first and second body mounted on said swivel pin whereby predetermined lengths of said dual chain may be rotated perpendicular to the direction of movement of said chain.

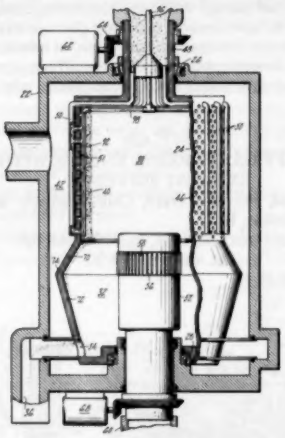
4,177,636

CENTRIFUGAL FLUIDIZED BED COMBUSTOR

John J. Horgan, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,035
Int. Cl.[2] F02C *3/26;* F23D *19/00*
U.S. Cl. 60—39.35 **12 Claims**

1. A coal-fired combustor having a rotary drum supported vertically with respect to the earth's horizon having a cylindrically shaped wall defining a combustion chamber, means for fluidizing the coal to form a fluidized coal bed adjacent the inner surface of said cylindrically shaped wall and surrounding said combustion chamber, means including openings in the cylindrically shaped wall for admitting coal internally of said cylinder through the outer surface of said cylindrically shaped wall so that said coal is admitted therein radially and is directed toward the axis of rotation of said drum, air admitted internally through openings in said cylindrically shaped wall flowing toward said axis of rotation effectuating the fluidizing of the bed and means communicating with said combustion chamber for leading products of combustion out of said combustion chamber, said bed having sulphur absorbing material, and means for imparting rotary motion to said drum at a speed for forming said fluidized bed so that said coal passes through said bed in the process of combustion and the sulphur constituent of



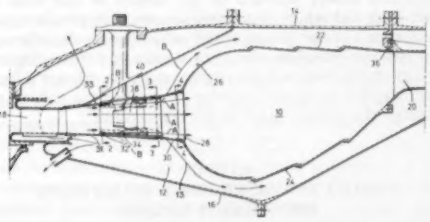
the coal is absorbed by the sulphur absorbing material in said bed.

4,177,637

INLET FOR ANNULAR GAS TURBINE COMBUSTOR

George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 19, 1977, Ser. No. 862,193
Claims priority, application United Kingdom, Dec. 23, 1976, 53950/76
Int. Cl.[2] F02C *3/06, 3/08*
U.S. Cl. 60—39.36 **6 Claims**



1. Combustion equipment for receiving compressed air from a compressor of a gas turbine engine, said combustion equipment comprising:

an annular flame tube defined by radially spaced walls and an upstream end plate having a plurality or circumferentially spaced apertures;

a plurality of pots, each being arranged in one of said apertures and projecting therefrom in an upstream direction from said flame tube;

radially spaced walls defining an annular diffusing passageway for receiving all compressed air from the compressor of the gas turbine engine, said annular diffusing passageway extending in a downstream direction and terminating adjacent to upstream ends of said pots;

a plurality of circumferentially spaced tubular ducts within the annular diffusing passageway, there being one of said tubular ducts for each of said pots, each of said tubular ducts being contiguous with at least a part of the spaced walls of said annular diffusing passageway, said tubular ducts extending from a position intermediate the ends of said annular diffusing passageway downstream to a position contacting an upstream end of one of said pots;

and a fuel burner positioned in each of said tubular ducts

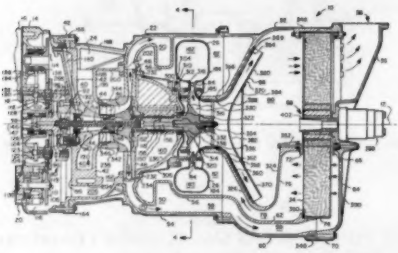
whereby some of the compressed air delivered to said annular diffusing passageway flows through said tubular ducts into said pots and said flame tube together with fuel from said fuel burner while the remaining compressed air delivered to said annular diffusing passageway flows between adjacent circumferentially spaced tubular ducts and from the downstream end of said diffusing passageway over the upstream end plate of said flame tube.

4,177,638

SINGLE SHAFT GAS TURBINE ENGINE WITH RADIAL EXHAUST DIFFUSER

Homer J. Wood, Sherman Oaks, Calif., assignor to Deere & Company, Moline, Ill.

Filed Jun. 24, 1975, Ser. No. 589,909
Int. Cl.[2] F02C *7/10*
U.S. Cl. 60—39.51 H **6 Claims**



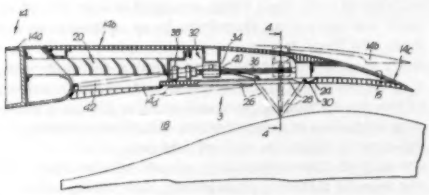
1. A gas turbine engine comprising a compressor mounted for rotation about a central axis; a single stage radial inflow turbine mounted axially forward of the compressor for rotation about the central axis, the turbine engine being coupled to drive the compressor and being arranged to discharge exhaust gases in an axially forward direction; a disk regenerator which is mounted axially forward of the turbine in line with the central axis and which is coupled to pass high pressure gases therethrough in one direction and exhaust gases therethrough in an opposite direction; and a radial exhaust diffuser disposed between the turbine and the regenerator, the exhaust diffuser being coupled to receive exhaust gases from the turbine and discharge the exhaust gases to the regenerator.

4,177,639

THRUST REVERSER FOR A FLUID FLOW PROPULSION ENGINE

Maurice I. Taylor, Allestree, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 12, 1978, Ser. No. 896,021
Claims priority, application United Kingdom, Jun. 5, 1977, 19009/77
Int. Cl.[2] F02K *1/20*
U.S. Cl. 60—226 A **3 Claims**



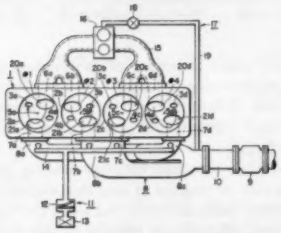
1. A gas turbine ducted fan propulsion engine including a core gas generator, a stage of fan blades mounted coaxially with and upstream of said core gas generator so as to be rotated thereby, a fan cowl surrounding said fan blades and forming with the core gas generator, a fan duct through which air acted upon by said fan blades passes to an exhaust nozzle, said fan cowl comprising a fixed upstream portion, a fixed downstream portion axially spaced therefrom to form a passage therebetween, a translatable intermediate portion which in a cruise position, closes said passage at its outer end with respect to the fan duct and a translatable cylinder which in said cruise positon, closes said passage at its inner end, a plurality of blocker flaps peripherally of and nested within the inner surface of the fixed downstream portion and movably connected thereto by their upstream ends, for simultaneous translation axially of the duct and pivoting thereacross, said intermediate portion, cylinder and blocker flaps being interconnected via means adapted to also bring about simultaneous translation and pivoting of said respective intermediate portion, cylinder and blocker flaps, such that on said translation being achieved, said cylinder covers recesses left by said blocker flaps.

4,177,640

INTERNAL COMBUSTION ENGINE SYSTEM

Hiroshi Kuroda, Tokyo; Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 4, 1977, Ser. No. 793,492
Claims priority, application Japan, May 7, 1976, 51/58134[U]
Int. Cl.[2] F02M *25/06*; F02B *75/18*
U.S. Cl. 60—274 **17 Claims**



16. A method of operating a multi cylinder internal combustion engine of the in-line type which is equipped with a cross-flow type cylinder head comprising the steps of:

preparing a combustible charge containing air, EGR gas and a hydrocarbon fuel which has an air:fuel ratio in the range of 13:1 to 16:1 and contains EGR gas recirculated at a rate of up to 40%;

feeding said charge through an induction manifold which is arranged to have the minimum possible overall length by arranging the inlet ports of the most outboard cylinders, inboard of the corresponding exhaust ports;

introducing the charge through inlet ports into simply configured combustion chambers so that the charge swirls within the combustion chambers;

igniting the charge by using two symmetrically disposed, diametrically opposed, synchronously sparked spark plugs projected through the cylinder head so that the spark gaps thereof are spaced by a distance L defined as follows,

$L = (0.45 \text{ to } 0.67)D$ where D is the diameter of the cylinders;

discharging the combustion products resulting from said ignition through individual exhaust ports;

mixing secondary air with the combustion products in the exhaust ports;

supplying said secondary air via a reed valve operated by the pulsations of the combustion products in the exhaust ports;

recirculating a portion of the combustion products to the induction manifold for the preparation of the combustible mixture; and

oxidizing the HC and CO in the remaining unrecirculated

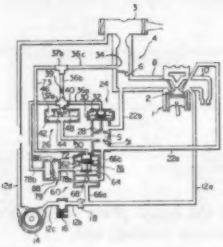
combustion products via the secondary air mixed therewith in an oxidizing type catalytic converter.

4,177,641

APPARATUS FOR CLEANING EXHAUST GAS FOR AN INTERNAL COMBUSTION ENGINE

Nobuaki Wakita, and Eiji Hashimoto, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1978, Ser. No. 910,097
Claims priority, application Japan, Mar. 7, 1978, 53/024990
Int. Cl.[2] F02B *75/10*; F01N *3/10*
U.S. Cl. 60—278 **2 Claims**



1. An apparatus for cleaning exhaust gas of an internal combustion engine, comprising:

exhaust gas recirculation passageway means adapted for connecting an exhaust system of the engine with an intake system of the engine for introducing a part of the exhaust gas in the exhaust system into the intake system;

first valve means for controlling pressure of recirculated exhaust gas in said exhaust gas recirculation passageway means so that said pressure is maintained at a predetermined pressure which is close to the atmospheric air pressure;

air pump means for generating a flow of air;

secondary air introduction passageway means connecting said air pump means with said exhaust system for introducing secondary air into said exhaust system;

by-pass passageway means connecting said secondary air introduction passageway means with said exhaust gas recirculation passageway means for diverting a part of said secondary air in said secondary air introduction passageway means into said exhaust gas recirculation passageway means;

second valve means for controlling the amount of said diverted air; and

vacuum control means for controlling the opening of said second valve means in accordance with opening of a throttle valve and for controlling the opening of said second valve means so that a large amount of diverted air is passed through said second valve means for a predetermined period after said throttle valve is opened from a closed position.

4,177,642

DIVERTER VALVE FOR EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

Leo T. Klimazewski, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,054
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—290 **11 Claims**

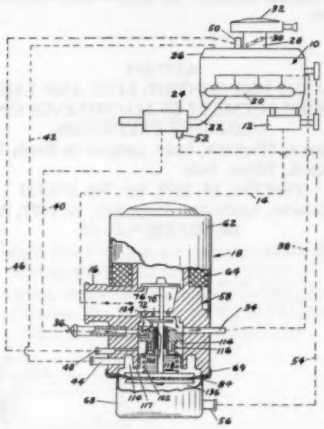
1. An air control valve for use on an internal combustion system having an exhaust manifold and an exhaust pipe extending from the exhaust manifold with a catalytic converter in the exhaust pipe, and an air pump for supplying air to the exhaust system, said air control valve comprising:

a valve body having a central bore forming an air chamber, an air inlet extending to the air chamber, and at least a pair of air outlets leading from the air chamber, one of said air outlets being connected to the exhaust system upstream of the catalytic converter and the other outlet being connected to the catalytic converter;

valve means positioned in the chamber between the outlets and shifting alternately between open and closed positions of the outlets, the inlet being in fluid communication with one outlet when the valve means is in one position and in fluid communication with the other outlet when the valve means is in another position;

a valve stem positioned in said air chamber having said valve means mounted thereon;

a main diaphragm assembly on the valve body and connected to an end of the valve stem, spring biasing means to



urge the diaphragm assembly and the valve means to a position for supplying air to the exhaust system, a vacuum chamber for said valve means, a vacuum line extending from the intake manifold of the internal combustion engine to the vacuum chamber, and temperature responsive means operatively connected to said vacuum line to permit the exertion of a vacuum against the valve means during cold engine operation to permit movement of the valve means to a position for the supply of air to the exhaust system upstream of the catalytic converter, said temperature responsive means being operable to interrupt the exertion of a vacuum against the valve means through said vacuum line during warm engine operation to permit movement of the valve means to a position for the supply of air to the catalytic converter.

4,177,643

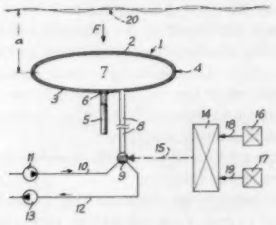
METHOD FOR COLLECTING ENERGY FROM SWELL AND PLANT FOR CARRYING OUT SAID METHOD

Michel Lorphelin, 5 rue Denis-Poisson, 75017 Paris, France

Filed Oct. 27, 1977, Ser. No. 846,123
Claims priority, application France, Nov. 2, 1976, 76 33012
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—496 **20 Claims**

1. A method of collecting energy from a swell in a fluid medium using a mobile float which is displaceable in response to movements of the swell, comprising the steps of submerging the float in a fluid medium at a predetermined depth, said predetermined depth being selected such that, in the absence of movement of the fluid medium, the upwardly and downwardly

directed forces acting on the float counterbalance each other so that the float is in equilibrium at such predetermined depth,



and adjusting the buoyancy of the float so as to maintain it in equilibrium.

4,177,644

APPARATUS FOR CONTROLLING AND TAKING UP AXIAL DISPLACEMENT IN MACHININGS ON LARGE DIAMETER CYLINDERS

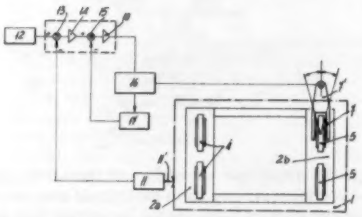
Cesare Panzeri, Macherio, Italy, assignor to Breda Termomeccanica S.p.A., Milan, Italy

Filed Feb. 14, 1978, Ser. No. 877,733

Claims priority, application Italy, Feb. 15, 1977, 20302 A/77

Int. Cl.[2] F01B *23/00*

U.S. Cl. 60—721 **9 Claims**



1. An apparatus for controlling and taking up the axial displacement of large rotating cylinders, wherein the cylinder rests on a pair of end bearings, of which one bearing is provided with driven rollers, while the other is provided with idle rollers, of which one is a guide roller carried by a bearing orientable about a vertical axis, comprising a first transducer for sensing the axial cylinder displacement, the output of which is connected to an input of a first device and compared with a reference signal supplied to another input to said first device, the output of the latter being operatively connected through an amplifier to an input of a second comparing device, a second input of which is connected to the output of a second displacement transducer for the bearing of the guide roller, the output of said second comparing device being supplied to a servoactuator mechanically connected to the orientable bearing of said guide roller.

4,177,645

PROCESS FOR ISOLATING DINITROGEN MONOXIDE

Hans-Helmut Schwarz, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,507

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732267

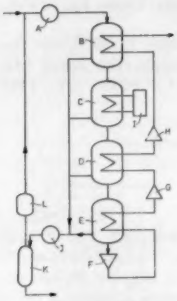
Int. Cl.[2] F25J *3/06*

U.S. Cl. 62—23 **4 Claims**

1. A process for isolating dinitrogen monoxide from oxidation off-gases formed by the oxidation of a cycloalkanol or a cycloalkanone using nitric acid which off-gases contain dinitrogen monoxide in admixture with nitrogen oxide, nitrogen dioxide, nitrogen, oxygen, carbon-dioxide and/or stream which comprises:

A. Drying the oxidation off-gas;

B. Compressing the resultant off-gas from which water has been removed to a pressure in the range of 15 to 300 bars and cooling the same to a temperature in the range of 0° to −88° C.;



C. Removing the liquid phase obtained as a result of said compression and cooling; and

D. Cooling the resultant gas phase by expansion and passing the same in indirect heat exchange with off-gas which has been prepurified by removal of water content thereof.

4,177,646

LIQUEFIED GAS APPARATUS

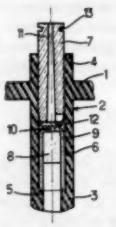
Laurent J. Guadagnin; Claude R. Grossiord; John A. Jensen, all of Annecy, France; Antoine Kawam, Washington, D.C.; Jacques M. Mouchet, Annecy-le-Vieux, and Michel E. Royer, la Balme de Sillingy, both of France, assignors to S. T. Dupont, Paris, France

Filed Nov. 17, 1977, Ser. No. 852,415

Claims priority, application France, Nov. 19, 1976, 76 35039

Int. Cl.[2] F17C *7/00*

U.S. Cl. 62—52 **14 Claims**



1. A liquefied gas apparatus comprising a vaporizer-pressure reducer ensuring both transition into the gaseous state of gas stored in the liquid state and control of the flow of the gas discharged therefrom, all solid portins of said apparatus with which said vaporizer-pressure reducer is in contact having a thermal conductivity in the range 0.3 to 5 kcal/m/h/°C.

4,177,647

AIR SLIDE FREEZER SYSTEM

Milan R. Overbye, Bellevue, Wash., assignor to Lewis Refrigeration Co., Redmond, Wash.

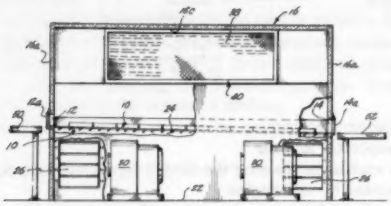
Filed Oct. 6, 1977, Ser. No. 840,011

Int. Cl.[2] F25D *13/06*

U.S. Cl. 62—63 **14 Claims**

1. A system for freezing of comestibles prepackaged in substantially flat bottom storage containers, said system com-

prising conveyor deck means including an elongated substantially flat stationary conveyance surface extending longitudinally from a container input location to a container output location and adapted to support thereon a plurality of such containers distributed over its length between said locations, said conveyance surface having a plurality of air discharge apertures therein distributed over its length at locations to underlie said containers, air freezer means including heat exchange means, blower means and associated closed air recirculation means cooperable to freeze and pressurize and to recirculate the pressurized freezing air continuingly in a path that includes plenum space beneath said surface wherein the air is pressurized for upward flow through said discharge apertures and collecting space overlying said surface for return of air to the suction side of said blower means, thereby to form and



maintain beneath each container a bearing film of freezing air flowing outwardly from between said conveyance surface and the bottom of each container, the film air pressure being effective to elevate said containers slightly above said surface to permit substantially frictionless advancement of the containers over said surface, and the film airflow velocity relative to each container being effective to transfer heat rapidly from the containers and thereby from the comestibles therein, and means to effect substantially concurrent progressive advancement of said film-borne containers in the direction from said input location to said output location at a controlled average rate substantially negligible in relation to said film air flow velocity, whereby rate of heat removal from the comestibles is substantially independent of such advancement rate including variations therein.

4,177,648

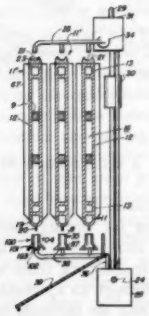
FREEZING APPARATUS AND METHOD

Robert S. Ohling, San Jose, Calif., assignor to Acoolco Corporation, Watsonville, Calif.

Division of Ser. No. 583,196, Jun. 2, 1975, Pat. No. 4,107,943. This application Mar. 30, 1978, Ser. No. 891,597

Int. Cl.[2] F25C *5/10*

U.S. Cl. 62—73 **10 Claims**



1. A method of freezing a liquid comprising the steps of

(a) establishing a freezing zone,

(b) delivering the liquid to the freezing zone so that the liquid runs across the freezing zone,

(c) collecting the unfrozen liquid running off the freezing zone so that it is returned to the freezing zone,

(d) stopping the delivery of liquid when a sheet of frozen liquid of predetermined thickness is on the freezing zone,

(e) continuing the freezing step to harden the sheet of frozen liquid,

(f) initially heating the periphery of the freezing zone in order to thaw the bond between the freezing zone and the sheet around the periphery of the sheet,

(g) then heating the freezing zone through out in order to harvest the sheet of frozen liquid by thawing the remainder of the bond between the freezing zone and the sheet, and

(h) gravity dropping the sheet from the freezing zone into a fragmenting zone where the sheet is broken into fragments.

4,177,649

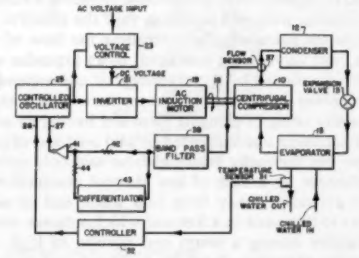
SURGE SUPPRESSION APPARATUS FOR COMPRESSOR-DRIVEN SYSTEM

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1977, Ser. No. 847,635

Int. Cl.[2] F25B *1/00*

U.S. Cl. 62—209 **12 Claims**



1. A control system for dynamically controlling surge in a compressor-driven system wherein gas flows through a containment circuit including an adjustable capacity compressor, the discharge pressure of the gas at the compressor outlet varying as a function of the gas flow rate, comprising:

means for adjusting the capacity of the compressor to select the steady state operating point on the discharge pressure versus flow rate characteristic curve;

sensing means for sensing a predetermined parameter which is subject to substantial variations if surging occurs;

means, responsive to said sensing means, for developing a feedback signal which is a function of said predetermined parameter; and

regulating means responsive to said feedback signal for dynamically varying the capacity of the compressor to vary the instantaneous operating point alternately back and forth around the steady state operating point and to effect a negative slope to the portion of the pressure-flow curve over which the instantaneous operating point dynamically varies, thereby preventing surge and stabilizing the operation of the compressor-driven system.

4,177,650

CRYOGENIC COOLING APPARATUS

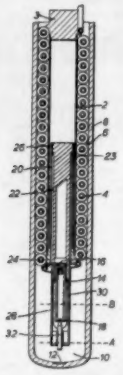
David N. Campbell, Alcester, England, assignor to The Hymatic Engineering Company Limited, Worcestershire, England

Filed Jan. 13, 1978, Ser. No. 869,230

Claims priority, application United Kingdom, Jan. 13, 1977, 1336/77

Int. Cl.[2] F25B *41/04*

U.S. Cl. 62—222 **7 Claims**



1. Cryogenic cooling apparatus of the type including a generally tubular heat exchanger having a warm end and a cold end and affording two paths, through one of which refrigerant gas flows from a supply under pressure to an expansion nozzle for producing cooling by means of the Joule Thomson effect in a liquefying chamber in said apparatus while the low pressure gas returns through said other path to cool the incoming refrigerant, said cryogenic cooling apparatus including a valve member cooperating with said nozzle to vary the effective area of said nozzle for automatically controlling the flow of said refrigerant, said valve being connected to an expander wherein said valve is actuated by the expansion of said expander, said expansion being caused by the temperature of said expander, said expander being of elongate form and having an anchored end, said anchored end supported by said cold end of said heat exchanger but thermally insulated from said cold end of said heat exchanger by a path of low thermal conductivity, said expander extending away from said warm end of said heat exchanger to terminate in a free end which actuates said valve, said expander having a warm end portion of high thermal conductivity extending from its anchored end to a region between said nozzle and said heat exchanger, said region being out of the direct line of spray of refrigerant from said nozzle, said expander also having a cold end portion of lower thermal conductivity extending from said region to the vicinity of said valve.

4,177,651

APPARATUS AND METHOD OF HEATING AND COOLING

Lorrell C. McFarland, 417 E. 12, Claremore, Okla. 74017

Filed Dec. 28, 1977, Ser. No. 865,266

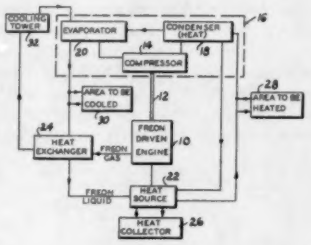
Int. Cl.[2] F25B *27/00*

U.S. Cl. 62—238 **4 Claims**

1. The method of utilizing the normally wasted heat of an air conditioning system, comprising: providing an air conditioner unit having a compressor, a condenser and an evaporator; drivably connecting a liquid hydrocarbon operated engine with said

compressor; connecting a primary heat source with said engine; conveying the heat exhausted by said condenser to the primary

heat source; connecting said evaporator with a heat exchanger; interposing an area to be cooled between the evaporator and the



heat exchanger; passing the heated liquid hydrocarbon exhausted by said engine

through said heat exchanger; and, returning the cooled liquid hydrocarbon to said engine.

4,177,652

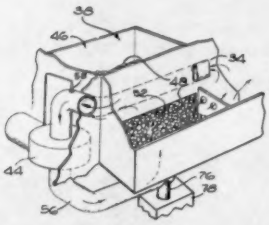
REFRIGERATION SYSTEM

Lawrence C. Volk, 10001 Beech St., Fontana, Calif. 92335

Continuation-in-part of Ser. No. 717,101, Aug. 24, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,221

Int. Cl.[2] B60H *3/04*

U.S. Cl. 62—239 **3 Claims**



1. In combination, a refrigeration system and a catering truck comprising:

a reservoir for ice cubes;

a food compartment for storing food under refrigeration having a cooling section adjacent thereto;

means for gravity feeding ice from said reservoir to said cooling section through an aperture interconnection;

a blower for directing air through an intake pipe to said cooling section and then circulating cooled air from said cooling section through said food compartment; and

an exhaust pipe interconnecting said food compartment and

said blower for recirculating air in said food compartment to said blower drain means for removing ice melt from the cooling section.

4,177,653

SLUSH FILTRATION METHOD

Donald A. Hickson, Benicia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 20, 1978, Ser. No. 953,293
Int. Cl.[1] F25D 3/12; B01D 37/00
U.S. Cl. 62—534 **4 Claims**

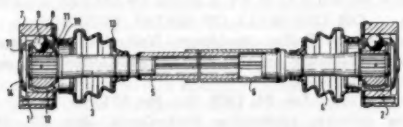
1. A process for separating colloidal zeolite particles from a liquid dispersion of the particles, which comprises: cooling the liquid dispersion of the particles to form a slush; allowing the slush to melt; and filtering the colloidal particles from the melting slush during the course of melting.

4,177,654

TRANSMISSION SHAFT

Erich Aucktor, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp G.m.b.H., Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,111
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648569
Int. Cl.[2] F16D 3/02
U.S. Cl. 64—21 **1 Claim**



1. A machine drive transmission shaft having a variable length adjustment comprising a pair of synchronous speed torque coupling joints each rotatable about an axis with said joints disposed in spaced relation and with the axes thereof disposed in general alignment, an axially elongated telescopic shaft extending between and in general axial alignment with and interconnecting said coupling joints, each of said coupling joints comprises an inner joint member having an outer surface encircling the axis of said inner joint member and with a plurality of axially extending circumferentially spaced rectilinear grooves formed therein, a hollow outer joint member enclosing said inner joint member and having an inner surface encircling the axis of said outer joint member and spaced outwardly from the outer surface of said inner joint member, the inner surface of said outer joint member having a plurality of axially extending circumferentially spaced rectilinear grooves formed therein, a plurality of balls each slidably seated in a different one of the grooves in said inner joint member and in an oppositely disposed groove in said outer joint member for transmitting torque between said inner and outer joint members, said inner and outer joint members in each said coupling joint being axially slidable relative to one another, said telescopic shaft comprising a spindle connected to each said inner joint member and extending therefrom in the axial direction of said telescopic shaft toward the other said spindle, a first shaft member attached to and extending axially from one of said spindles and a hollow second shaft member attached to and extending axially from the other one of said spindles, said first shaft member extending into said hollow second shaft member in closely fitting sliding relation so that the overall length of the transmission shaft can be varied, the outer surface of said first shaft member and the inner surface of said second shaft member having complementary non-circular interfitting cross sections so that torque can be transmitted therebetween, and a cage positioned between the inner surface of said outer joint member and the outer surface of said inner joint member and encircling said inner joint member, said cage having a plurality of circumferentially spaced openings therein for each of said balls.

4,177,655

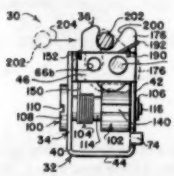
Patent Not Issued For This Number

4,177,656

CABINET LOCK

Edwin W. Davis, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Mar. 2, 1978, Ser. No. 882,660
Int. Cl.[2] E05B 65/44; E05C 3/02
U.S. Cl. 70—84 **30 Claims**



1. A cabinet lock, comprising:

(a) a one-piece housing having front and back walls extending in spaced, substantially parallel planes, the front and back walls having overlying first and second ends, the front and back walls being interconnected near their first ends by an end wall, and being interconnected near their second ends by a pair of side walls, the side walls extending in spaced parallel planes which substantially orthogonally intersect the planes of the front and back walls, the front and back walls having a first set of aligned holes formed therethrough, the side walls having a second set of aligned holes formed therethrough;

(b) actuator means extending into the first set of holes and being supported by the front and back walls;

(c) rotary latch bolt means extending into the second set of holes and being supported by the side walls;

(d) the actuator means including:

(i) a cam member mounted for movement between locked and unlocked positions; and,

(ii) first biasing means biasing the cam member toward its locked position;

(e) the rotary latch bolt means including:

(i) a latch bolt member mounted for rotary movement about the axis of the second set of holes between latched and unlatched positions; and,

(ii) second biasing means biasing the latch bolt member toward its unlatched position;

(f) the cam member and the latch bolt member having interengaging surface means formed thereon for:

(i) permitting the cam member to move, under the influence of the first biasing means, to its locked position when the latch bolt member is moved, in opposition to the action of the second biasing means, from its unlatched position to its latched position; and

(ii) retaining the latch bolt member in its latched position until the cam member is moved, in opposition to the action of the first biasing means, to its unlocked position.

4,177,657

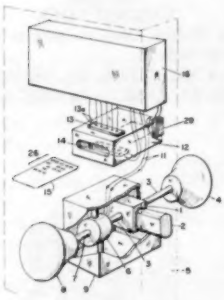
ELECTRONIC LOCK SYSTEM

Kemal Aydin, Little Falls, N.J., assignor to Kadex, Inc., New York, N.Y.

Continuation of Ser. No. 667,105, Apr. 16, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,163

Int. Cl.[2] E05B *49/02*

U.S. Cl. 70—278 **5 Claims**



1. A locking system comprising a key having first and second coded data thereon, a lock having a bolt operating mechanism, a memory, means for sensing data on said key, means responsive to sensed first data that corresponds to data stored in said memory connected to operate said bolt operating mechanism, and means responsive to sensed second data for changing the data in said memory to correspond to said second data, said lock comprising a slot for receiving said key, and switch means responsive to full insertion of said key in said slot and coupled to enable said sensing means, said sensing means sensing coded data on said key as said key is withdrawn from said slot.

4,177,658

METHODS AND APPARATUS FOR CONTINUOUS EXTRUSION

Nazeer Ahmed, Tumkur, India, and Francis J. Fuchs, Jr., Princeton Junction, N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jun. 8, 1978, Ser. No. 913,761

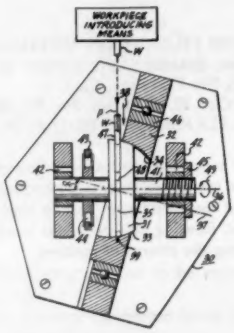
Int. Cl.[2] B21B *27/00, 45/02;* B21C *23/32*

U.S. Cl. 72—60 **10 Claims**

1. A method of continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, the method comprising the steps of:

(a) introducing the elongated workpiece into a first portion of an annular groove in one of two mating surfaces, the two mating surfaces being an outer surface of an inner toroid and an inner surface of an outer toroid, the inner and outer toroids having respective axes which intersect at such an angle that a second portion of the annular groove is covered by the mating surface which does not include the annular groove while said first portion of the annular groove is not covered by said mating surface which does not include the annular groove;

(b) rotating the inner and outer toroids simultaneously about



their respective axes, in such direction of rotation that the elongated workpiece is advanced from said first portion of the annular groove into said second portion of the annular groove, and then into a deforming agency as the advancing, elongated workpiece again approaches said first portion of the annular groove; and

(c) so deforming the elongated workpiece within the deforming agency as to produce an elongated product of indefinite length.

4,177,659

ROTATABLE PIERCING TOOLS FOR FORMING HOLES SURROUNDED EACH BY A BOSS IN METAL PLATES OR THE WALL OF METAL TUBES

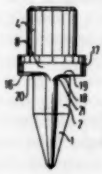
Johannes A. van Geffen, Apeldoorn, Netherlands, assignor to Technisch Handels- en Adviesbureau van Geffen B.V., Apeldoorn, Netherlands

Filed Jan. 24, 1978, Ser. No. 871,975

Claims priority, application Netherlands, Jan. 27, 1977, 7700872

Int. Cl.[2] B21D *28/36*

U.S. Cl. 72—71 **6 Claims**



1. A piercing tool comprising an elongate body having a shank portion at one end adapted to be gripped and rotated by a power tool, said tool having a tapered tip at that end opposite said shank portion, an intermediate portion joining said tip, and a third portion joining said intermediate portion to said shank portion, said tip and intermediate portion being of polygonal cross section presenting a plurality of side faces and longitudinally extending corners joining adjacent side faces, the corners of said intermediate portion extending parallel to the axis of said body and being disposed at the same radial spacing therefrom, the corners of said tip forming extensions of the corners of said intermediate portion whereby the tool may pierce a thin

walled metal member and thereafter form, by frictional heat and pressure, an expanded hole through the metal member which is surrounded by a boss of substantially greater height than the thickness of the metal member and which projects from opposite sides of the members;

said third portion being of cylindrical form having a diameter greater than that of said boss to define a bottom face whereby the third portion overhangs said intermediate portion; and

means only at the juncture of at least some of said corners of the intermediate portion and said bottom face of said third portion for bevelling the inside of said boss.

4,177,660

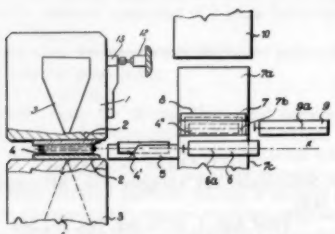
APPARATUS FOR FEEDING WORKPIECES FOR CROSS WEDGE ROLLING

Jan Kovar, Ricmanice, and Jan Drkal, Brno, both of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia

Filed Mar. 24, 1978, Ser. No. 890,023

Int. Cl.[2] B21H *9/00*

U.S. Cl. 72—108 **6 Claims**



1. In cross wedge rolling apparatus including a cross wedge rolling mill stand having opposed rolls, the improved mechanism for feeding workpieces to the rolling mill stand, comprising a stand-by trough disposed substantially on the axis of cross rolling, an auxiliry trough above the axis of cross rolling, a supply chute above the auxiliary trough for supplying workpieces to be rolled to said auxiliary trough, the supply chute terminating at the auxiliary trough, a first power cylinder for shifting a workpiece in the auxiliary trough to the stand-by trough, a second power cylinder for shifting a workpiece in the stand-by trough to a position between the opposed rolls of the mill stand, and means selectively to discharge a workpiece from the auxiliary trough before it is fed to the stand-by trough.

4,177,661

METHOD AND APPARATUS FOR BENDING LARGE PIPES

Kurt Schwarzbach, Düsseldorf; Horst Koehler, Haan, and Franz Müller, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 7, 1976, Ser. No. 748,216

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2555326

Int. Cl.[2] B21D *7/024, 7/16*

U.S. Cl. 72—128 **4 Claims**

1. Apparatus for bending large pipes including:

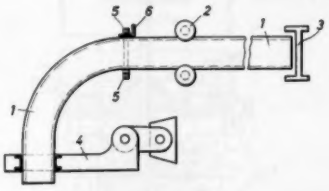
(a) a guidance device for guiding a pipe to be bent;

(b) a pressure element for pushing the pipe through said guidance device;

(c) a heat source placed downstream from the guidance device in a direction of movement of the pipe for inductively heating the pipe, said heating source being of annular shape;

(d) a turning lever for receiving and holding the free end of the pipe during bending, the improvement comprising:

(e) a screen disposed between said heating source and said guidance device but not mounted on the pipe, said screen being movable in the direction of the axis of the pipe to be bent and being disposed between the wall of the pipe and said annular heat source opposite to the location of the turning axis of the lever about which the pipe is being



bent, said screen being shaped to cover less than the full circumference of the pipe but at least approximately one third of the circumference of the pipe and having maximum thickness adjacent to a line of largest curvature of the bending and turning, and tapering down adjacent to sides of the pipe undergoing medium curving upon bending, said screen being stationary relative to the pipe during bending by operation of turning of the lever.

4,177,662

MACHINE FOR THE MANUFACTURE OF AXIALLY PRESTRESSED COILS FROM STRIP

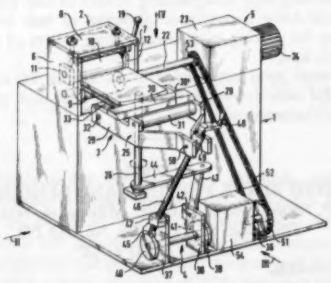
Günter Weinmann, Robert-Schumann-Str. 5, D-6053 Obertshausen, and Heinz Vogel, Waldstrasse 13, D-6239 Diedenbergen, both of Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,519

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700033

Int. Cl.[2] B21F *3/02, 3/10;* **B21D** *11/06*

U.S. Cl. 72—138 **15 Claims**



1. A machine for the manufacture, from a strip, of an axially prestressed coil for covering of machine parts, comprising a feed roller pair for feeding the strip by use of an associated feed drive mechanism, an adjusting device for adjusting one of said feed rollers to thereby change the gap between the two feed rollers, the feed rollers being movable against one another by a pressing device, a bending roller which is arranged in front of the feed roller pair, a bearing member for supporting one of the bending roller and the feed roller pair for pivotal movement by means of a swivel drive mechanism about an axis which extends perpendicularly to the plane of the strip which exits from the feed rollers and a shifting drive mechanism for shifting one of the bending roller and the feed rollers transversely to their axis and the feed drive mechanism, the swivel drive mechanism and the shifting drive mechanism being interconnected.

4,177,663

PIVOTABLE ROLLER FRAME ASSEMBLY FOR A MATERIAL STRAIGHTENING MACHINE

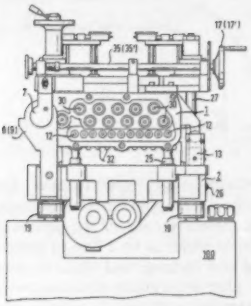
Horst Zerhoch, Sinzheim, Fed. Rep. of Germany, assignor to Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG, Sinzheim, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,528

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704674

Int. Cl.[2] B21D *1/02*

U.S. Cl. 72—165 **3 Claims**



1. A straightening machine for straightening flat and sheet materials flowing therethrough comprising:

an upper and a lower roller frame each having a pair of spaced mounting bars supporting a plurality of positively driven straightening rollers arranged traversely to the direction of material flow, the straightening rollers of said upper frame being staggered in relation to the straightening rollers of said lower frame;

means for pivotably coupling said upper roller frame to said lower roller frame, said means allowing said upper roller frame to pivot with respect to said lower roller frame about an axis which is parallel to the axes of said straightening rollers;

a first drive transmission attached to said upper roller frame for driving said straightening rollers of said upper frame;

a second drive transmission attached to said lower roller frame for driving said straightening rollers of said lower frame; and,

a universal joint connecting shaft having an axis in said pivotal axis drivingly connecting said first and second drive transmissions.

4,177,664

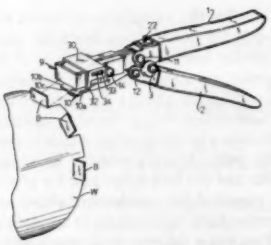
COMBINED BLANK FORMING AND BENDING TOOL

Howard P. Spors, 2162 S. 31th St., Milwaukee, Wis. 53215

Filed Jun. 13, 1978, Ser. No. ..5,271

Int. Cl.[2] B21D *31/02*

U.S. Cl. 72—326 **7 Claims**



1. A partial blank cutting and bending tool for sheet metal or the like and comprising, a pair of handles, a cutting female member and a cutting male member comprising a plate, said male member having connection means with said handles for being swung by said handles between workpiece cutting and workpiece releasing positions, said female member having a pair of spaced apart cutting edges and also having a connecting intermediate non-cutting edge between said pair of cutting edges, said male member having cutting edges and swingable between and in cutting cooperation with said cutting edges of said female member, said male member also having an intervening non-cutting edge between its cutting edges, said intervening edge being spaced a distance from said intermediate edge of said female member when said cutting members are urged together; the opposed cutting edges of said members cooperating to cut a pair of slits in the workpiece to define a partially cut blank, said connection means between said handles and said male and female members being positioned to cause said male intervening edge to swing past said female intermediate edge a distance spaced apart to thereby bend said blank between said connecting intermediate non-cutting edge and said intervening non-cutting edge and to a substantial right angle from its original position with said workpiece by movement between said cutting members, whereby a blank is partially cut and simultaneously bent from said workpiece.

4,177,665

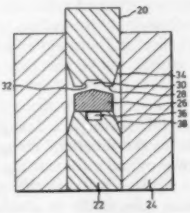
COLD FLOW FORMING

Heinz P. Schurmann, 421 Abington Ave., Mississauga, Canada (L5A 1L6)

Filed Apr. 3, 1978, Ser. No. 892,541

Int. Cl.[2] B21D *22/06*

U.S. Cl. 72—359 **14 Claims**



1. A process for producing cold flow formed items from slugs, the process comprising the steps:

providing a slug to be cold flow formed;

providing first and second dies aligned for relative movement axially towards and away from one another, the dies having respective opposed first and second faces and the first face defining a cavity having portions including generally axial walls, and the first die having a peripheral chamfer extending axially away from the first face;

providing a sleeve containing the first and second dies to combine with outer parts of the second face and the peripheral chamfer to define an annular space;

placing the slug between said dies inside the sleeve;

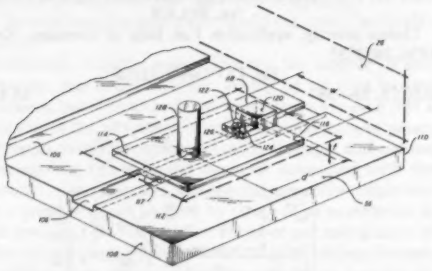
causing said relative movement between the dies to create an impact between the slug and the dies;

causing said relative movement to continue so that the slug is caused to cold flow into contact with said generally axial walls and also into the annular space so that destructive forces applied to the axial walls are countered by forces applied to the chamfer thereby stabilizing the material of the first die between the axial walls and the chamfer.

4,177,666
METHOD AND APPARATUS FOR SAFELY FEEDING A MACHINE MANUALLY

Edward F. Du Bois, and Arthur L. Papastrat, both of Binghamton, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,145
Int. Cl.[2] B21D *43/04, 5/02, 55/00*
U.S. Cl. 72—420 **7 Claims**



1. A press brake safety apparatus for safely inserting sheet material into the point of operation of a press brake having a danger zone, comprising:

(a) a surface plate for supporting the sheet material to be inserted into the press brake;

(b) a pusher, comprising:

(1) a pusher body for sliding along said surface plate, having a first pusher surface with a thickness of the order of the thickness of the sheet material being inserted, for abutment against the sheet material,

(2) a vertical surface element having a second pusher surface of substantially greater thickness than said first pusher surface, adjustably mounted on said pusher body and movable between a first position in which said second pusher surface coincides with said first pusher surface to form a composite pusher surface, and a second position in which said second pusher surface is recessed from said first pusher surface, and

(3) a handle, integral with said pusher body and located a sufficient distance from said first pusher surface such that the hand of the operator holding said handle will not enter the danger zone while using said pusher; and

(c) keying means interrelating said pusher and said surface plate and situated such that a predetermined pusher travel path is maintained relative to said surface plate.

4,177,667
QUICK RESPONSE HUMIDITY CHAMBER

Steven R. Rolf, Sundance, Wyo.; James L. DeVries, Sioux Falls, and T. Ashworth, Rapid City, both of S. Dak., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1978, Ser. No. 882,849
Int. Cl.[2] G01N *25/56*
U.S. Cl. 73—1 G **6 Claims**

1. A system for testing the response of sensors to fluid characteristics comprising,

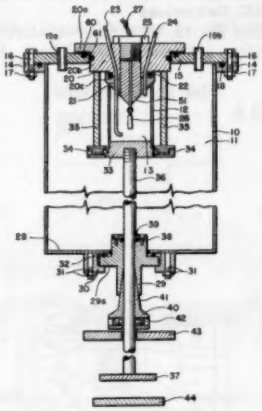
a first enclosure for retaining a first volume of fluid having a predetermined physical characteristic at a fixed value, said first enclosure having a circular opening at one end,

means positioned within said first enclosure for measuring the value of said characteristic,

a second enclosure for retaining a second volume of fluid having the same physical characteristic as said first volume but fixed at a different value, said first enclosure being positioned within said second enclosure,

a conical surface projecting within said circular opening of said first enclosure to seal said first enclosure within said second enclosure, and

means for causing the exchange of fluid between said volumes so that said means for measuring is subjected to the

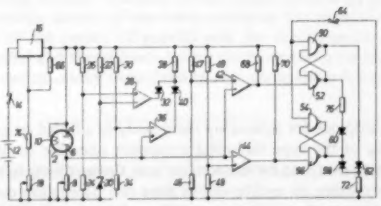


characteristic value of said second volume to provide a measurement of that value prior to fluid equilibration.

4,177,668
APPARATUS FOR DETERMINING THE ALCOHOLIC CONTENT IN THE BLOOD

Lars-Erik Holmberg, Box 184, S-201 21 Malmö, Sweden

Filed May 2, 1978, Ser. No. 902,050
Claims priority, application Sweden, May 4, 1977, 7705196
Int. Cl.[2] G01N *27/04*
U.S. Cl. 73—23 **14 Claims**



1. An apparatus for determing the alcoholic content in blood, comprising a sensor disposed to produce a signal in response to the alcoholic content of exhaled air to which it is exposed from a test person, and at least two comparator devices for comparing said output signal with at least two preset reference values, a logic circuitry of TTL elements connected to the output of the comparator devices is arranged to actuate at least one light emitting diode of a plurality of light emitting diodes, said actuated light emitting diode being determined by the result of said comparison for indicating the alcoholic content, said logic circuitry comprising two SR flip-flops with inverted inputs, each of said flip-flops being composed of two NAND gates which are connected to three light emitting diodes in such a manner that a first light emitting diode is actuated when the output signal from the sensor is below the first reference value, the first light emitting diode is extinguished and the second light emitting diode is ignited when the output signal is between the first and second reference value, and the third light emitting diode is ignited and the second is extinguished when the output signal exceeds the second reference value.

4,177,669

DEVICE FOR MEASURING THE DENSITY OF A FLUID

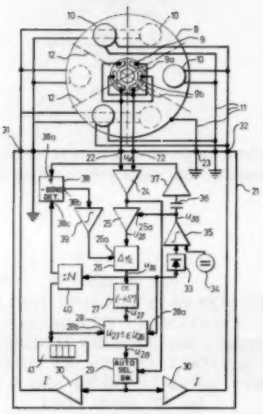
Alfred Wenger, Langenbruck, Switzerland, assignor to Institut Straumann AG, Switzerland

Filed Jul. 18, 1978, Ser. No. 925,751

Claims priority, application Switzerland, Jul. 27, 1977, 9278/77

Int. Cl.[2] G01N *9/00*

U.S. Cl. 73—32 A 10 Claims



1. In a device for measuring the density of a liquid or gaseous medium, of the type including a support operable to hold an oscillation body, to be introduced into the medium, in a position permitting its oscillation, at least one oscillation detector operable to produce, during operation of the device, an electric detector signal in dependence on the oscillation of the oscillating body, at least one oscillation generator operable to excite the oscillating body, and an electronic circuitry component connected to the oscillation detector and the oscillation generator and including one of a period meter and a frequency meter, for determining one of the period and frequency of oscillation, and at least one phase shifter operable to supply the oscillation generator with an electric excitation signal shifted in phase, through a phase angle, relative to the detector signal produced by the oscillation detector: the improvement comprising, in combination, said electronic circuitry component comprising means operable to vary both the phase angle, between the detector signal and the excitation signal, and the oscillation frequency at least approximately periodically within an interval at a frequency which is less than the oscillation frequency of the oscillating body; and control elements operable to control the phase and frequency position of such interval as a function of the variation of the ratio of the detector signal to the excitation signal, and of the relation, within such interval, of the variations of the detector signal, the excitation signal, and the phase angle between the detector and excitation signals.

4,177,670

METHOD AND APPARATUS FOR MULTIPLE TESTING OF WRAPPERS OF CIGARETTES FOR POROSITY

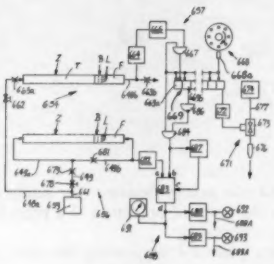
Uwe Heitmann, Schwarzenbek; Heinz-Christen Lorenzen, Hamburg; Günter Wahle, Reinbek, and Rolf Dahlgrün, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 859,950, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 840,562, Oct. 11, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,370

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653735

Int. Cl.[2] G01N *15/08*

U.S. Cl. 73—38 45 Claims



1. A method of testing wrappers of rod-shaped articles which constitute or form part of smokers' products, comprising the steps of measuring the permeability of at least the major portion of the wrapper of each of a series of successive articles; comparing the measured permeability with a predetermined value denoting the maximum permissible permeability of such portions of wrappers; measuring the permeability of predetermined portions of the wrappers of said series of articles, each of said measuring steps including establishing a pressure differential between the interior and the exterior of the respective wrappers; moving the articles of said series sideways along a predetermined path in the course of said measuring steps; generating signals denoting the permeability of said predetermined wrapper portions; and comparing said signals with a signal denoting the minimum acceptable permeability of said predetermined wrapper portions.

4,177,671

APPARATUS FOR SENSING AIR-PRESSURE DROP IN A TIRE

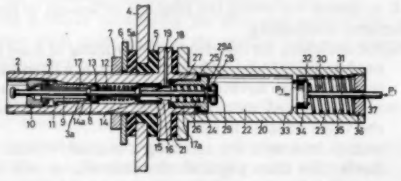
Isao Ichihara; Yasuo Oguni, and Harunori Shiratori, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 780,822, Mar. 24, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,649

Claims priority, application Japan, Mar. 25, 1976, 51-34005

Int. Cl.[2] B60C *23/04*

U.S. Cl. 73—146.5 6 Claims



1. An apparatus for sensing air-pressure drop in an automobile tire, adapted for connection with an ordinary air valve having a cylindrical valve body mounted to a tire rim and projecting into the tire at one end to define a valve port, a

valve member provided in said valve body designed to open and close a first air passage in said valve body, a second air passageway connected to said first passageway having an exit port on the interior of said tire, said valve port being connected with said first air passageway, a first valve rod axially movable for moving said valve member in one direction to open said first air passageway so that air flows from said first passageway into said second passageway and from there into said tire and a spring urging said valve member in another direction to close said first air passageway, said apparatus comprising:

a cylindrical housing mountable to said one end of said valve body;

a differential pressure sensor dividing the interior of said housing into a first chamber having an air inlet located between said first and second air passageways such that a portion of the air exiting from said first passageway passes through said inlet without passing through said second passageway and a second chamber connected with the interior of the tire, said sensor being normally maintained at a predetermined position by virtue of an equilibrium in air pressure between said first chamber and said interior of the tire and displaceable upon breakage of said equilibrium resulting from pressure drop in said tire to provide an indication of said air pressure drop;

a normally closed valve provided at said air inlet adapted to open for air connecting said first chamber with said first passageway in response to the opening of said first air passageway; and

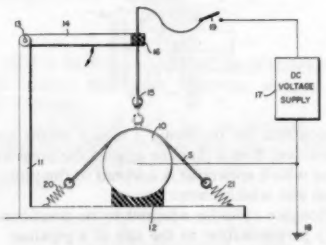
means provided in said second chamber for returning said sensor to said pedetermined position when said air pressure of said tire is raised to a level substantially equal to that of said first chamber.

4,177,672

WHISKERING TEST APPARATUS

Doulgas W. Donigian, Catonsville, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 6, 1978, Ser. No. 894,106
Int. Cl.[2] G01N *13/00*
U.S. Cl. 73—150 R **1 Claim**



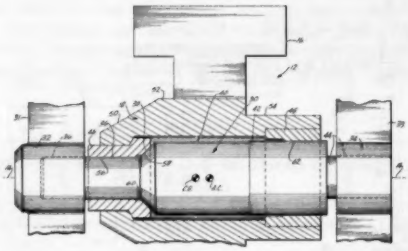
1. An apparatus for producing the whiskers associated with an electroassisted gravure printing process under static conditions without employing the dynamic printing conditions of an electroassisted gravure printing process comprising, a frame element, a conductive, grounded backing member mounted on said frame element, means for insulating said grounded backing member from said frame element, a pivotally adjustable arm member mounted on said frame element, a printing stylus connected to said arm member and arranged to lie normally in spaced relation from said backing plate, means for insulating said printing stylus from said arm member, and a DC power supply connected to said printing stylus, said power source being adapted to produce an electric field between said backing member and printing stylus after a drop of ink placed on said stylus is transferred to a printing substrate which is releasably attached in fixed relation on said backing member.

4,177,673

ANEMOMETER

Rudolph E. Krueger, 1201 Dolphin Ter., Corona Del Mar, Calif. 92625

Filed Jun. 8, 1978, Ser. No. 913,523
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—189 **31 Claims**



1. In an anemometer having a rotor assembly mounted on a rotor support shaft for rotation about an axis of the shaft, the rotor assembly having blade means for catching fluid flow against it for causing the rotor assembly to rotate about its axis at a speed which is converted into a signal proportional to fluid flow rate across the rotor assembly, an improved bearing arrangement for mounting the rotor assembly for rotation about the rotor support shaft, the improvement wherein the rotor assembly includes front and rear bearings secured to corresponding axially spaced apart front and rear portions of the rotor support shaft, the rotor support shaft having a front portion having a tapered surface which tapers wider toward a rear portion of the rotor support shaft, the front bearing having a tapered surface which tapers wider toward the rear portion of the rotor support shaft and bears against the tapered surface of the rotor support shaft, at least a portion of the cooperating tapered surfaces of the front bearing and the rotor support shaft being located upstream of the center of gravity and the aerodynamic center of the rotor assembly for supporting upstream of the center of gravity and the aerodynamic center both radial and thrust loads acting on the rotor assembly from fluid flowing axially from front to rear along the rotor support shaft.

4,177,674

SPREADER APPLICATION RATE MONITORING DEVICE

Leonald W. Friedenberg, and James A. Baker, both of Edmonton, Canada, assignors to Baker Engineering Enterprises Ltd., Edmonton, Canada

Filed Apr. 24, 1978, Ser. No. 899,541
Int. Cl.[2] B05B *12/00;* **G01F** *15/06*
U.S. Cl. 73—198 **3 Claims**

1. Apparatus for monitoring the volume of fluent material applied per unit area by mobile application equipment, including a storage tank (**100**), dispensing means (**111**), and conduit means connecting the tank with the dispensing means, comprising

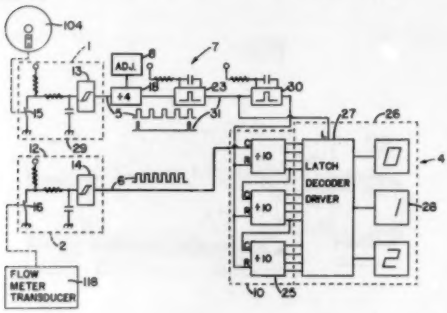
(a) first measuring means (**1**) operatively connected with the mobile application equipment for generating an area electrical pulse signal (**5**) having a frequency proportional to the rate at which a unit of area is traversed by the application equipment;

(b) second measuring means (**2**) including flow measuring means (**110; 118**) operatively connected in the conduit means for generating a volume electrical pulse signal having a frequency proportional to the rate at which a unit of volume of the material is applied by the application equipment;

(c) electrical circuit means including frequency multiplying means (**7**) and calibration adjustment means (**8**) for multi-

plying at least one of said area and volume pulse signals by a calibration factor that is determined from the size of at least one of the units of area and volume;

(d) pulse counting means (**10**) for accumulating pulses derived from said frequency multiplying means which are a function of the volume electrical pulse signal (**6**) for a



period of time which is a function of the area electrical pulse signal (**5**); and

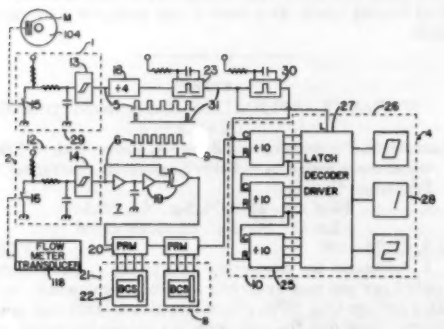
(e) display means (**4**) connected with said pulse counting means for indicating the number of pulses accumulated in said pulse counting means, whereby the resultant accumulated pulse value is proportional to the volume of material applied per unit area.

4,177,675

SPREADER APPLICATION RATE MONITORING DEVICE

Leonald W. Friedenberg, and James A. Baker, both of Edmonton, Canada, assignors to Baker Engineering Enterprises Ltd., Edmonton, Canada

Filed Apr. 24, 1978, Ser. No. 899,542
Int. Cl.[2] **B05B** *12/00*; **G01F** *15/06*
U.S. Cl. 73—198 **3 Claims**



1. Apparatus for monitoring the volume of fluent material applied per unit area by mobile application equipment, including a storage tank (**100**), dispensing means (**111**), and conduit means connecting the tank with the dispensing means, comprising

(a) first measuring means (**1**) operatively connected with the mobile application equipment for generating an area electrical pulse signal (**5**) having a frequency proportional to the rate at which a unit of area is traversed by the application equipment;

(b) second measuring means (**2**) including flow measuring means (**110**; **118**) operatively connected in the conduit means for generating a volume electrical pulse signal having a frequency proportional to the rate at which a unit of volume of the material is applied by the application equipment;

(c) electrical circuit means including frequency multiplying means (**7**) and calibration adjustment means (**8**) for multiplying said volume electrical pulse signal by a calibration factor that is determined from the size of the unit of volume;

(d) pulse counting means (**10**) for accumulating pulses derived from said frequency multiplying means which are a function of the volume electrical pulse signal (**6**) for a period of time determined by said first measuring means and corresponding to the time required by said application equipment to cover a unit of area; and

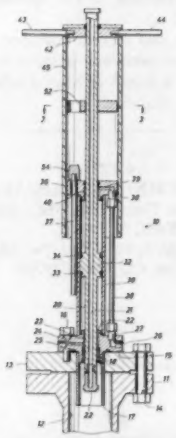
(e) display means (**4**) connected with said pulse counting means for indicating the number of pulses accumulated in said pulse counting means, whereby the resultant accumulated pulse value is proportional to the volume of material applied per unit area.

4,177,676

SENSOR POSITIONING APPARATUS

Robert H. Welker, P.O. Box 1228, Bellaire, Tex. 77401

Filed May 25, 1978, Ser. No. 909,452
Int. Cl.[2] **G01F** *15/18*
U.S. Cl. 73—198 **7 Claims**



1. An apparatus for mounting a sensor means for insertion into and removal from a pipeline against the pressure acting in the pipeline which apparatus is adapted to function at a tee on the pipeline and which comprises:

(a) an elongate cylinder adapted to be positioned approximately perpendicular to the axis of a pipeline;

(b) a piston slidably positioned in said cylinder;

(c) means for mounting said cylinder to said tee in the pipe;

(d) a piston rod connected to said piston and extending from said cylinder through the tee and into the pipeline on reciprocation by said piston;

(e) wherein said piston rod is adapted to support a sensor means at one end thereof which end is inserted into and removed from the pipe by operation of said piston moving in said cylinder; and

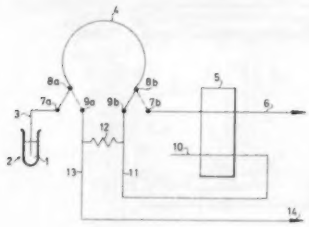
(f) wherein said mounting means includes

(1) a first flange plate constructed in accordance with industry standards and adapted to be mated against a coacting flange on the tee connected to the pipeline and wherein said first flange plate is axially open to receive said piston rod therethrough;

(2) a base plate adapted to be joined and sealed against said first flange plate on the top side thereof and further adapted to sealingly support said cylinder;

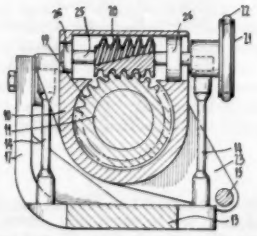
(3) seal means extending around said piston rod to prevent leakage of fluid from the pipe; and
(4) means for securing said base plate relative to said first flange plate.

4,177,677
SAMPLE SUPPLY TO AUTOMATIC ANALYZERS
Jaromir Ruzicka, Naerum, and Elo H. Hansen, Lyngby, both of Fed. Rep. of Germany, assignors to Bifok AB, Sollentuna, Sweden
Filed Sep. 12, 1977, Ser. No. 832,741
Claims priority, application Sweden, Sep. 13, 1976, 7610110
Int. Cl.[2] G01N *1/18*
U.S. Cl. 73—422 GC 4 Claims



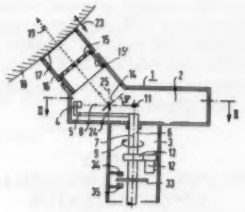
1. A method of supplying samples to a continuously flowing, non-segmented, unobstructed carrier solution for automatic analysis, comprising the steps of connecting a sampling conduit having a predetermined volume to a liquid sample supply and causing the liquid sample to occupy and fill said sampling conduit and thereby form a well-defined plug of known volume while said sampling conduit is disconnected from said flowing carrier solution, and automatically alternately disconnecting said sampling conduit from said supply while connecting said sampling conduit in a path of the flowing carrier solution which includes a shunt conduit having a much greater flow resistance than and parallel to said sampling conduit, and causing said carrier solution to flow through said sampling conduit and deliver said well-defined plug of sample to said path of flowing carrier solution.

4,177,678
DRIVE FOR BALANCING MACHINES
Gerhart W. Harant, Blackburn, Australia, assignor to Repco Limited, Australia
Filed May 30, 1978, Ser. No. 911,043
Claims priority, application Australia, Jun. 7, 1977, PD0375
Int. Cl.[2] G01M *1/16*
U.S. Cl. 73—460 4 Claims



1. An apparatus for rotating a workpiece to be balanced in a balancing machine of the kind having a spindle for supporting said workpiece for rotation, said spindle being rotatably supported on a spindle mounting frame arranged to enable out of balance forces to be resolved into a single direction and measured, said single direction being at right angles to the axis of said spindle, wherein said apparatus comprises a speed reduction means mounted on said frame to transmit drive to said spindle, said speed reduction means rotating at a speed significantly greater than the rotational speed of said spindle and including an input shaft arranged at substantially a right angle to said spindle axis, said speed reduction means being driven by drive means from a drive motor mounted away from said frame, said drive motor having its shaft axis parallel to said input shaft such that any cyclical force changes occurring in said drive means and spuriously reacted into said direction occur at a frequency substantially different to the frequency of signals resulting from out of balance forces in said workpiece.

4,177,679
ULTRASONIC APPLICATOR FOR ULTRASONIC SCANNING OF BODIES AND METHOD OF USING THE SAME
Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 10, 1976, Ser. No. 694,835
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529155
Int. Cl.[2] A61B *10/00*
U.S. Cl. 73—625 7 Claims



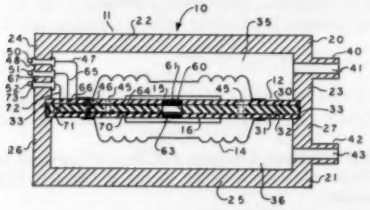
4. The method of scanning internal body regions accessible through narrow acoustic apertures, which comprises: sequentially directing ultrasonic beams along converging incident beam paths intercepted by a reflective surface, and disposing the reflective surface at such an angular relationship to the incident beam paths as to produce respective sequentially active reflected beams which converge interiorly of a body surface substantially at a narrow acoustic aperture within the body and such that the successive sequentially active reflected beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture.

4,177,680
DUAL PRESSURE SENSOR
Dennis C. Coleman, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Oct. 14, 1977, Ser. No. 842,189
Int. Cl.[2] G01L *9/12*
U.S. Cl. 73—718 18 Claims

1. A variable capacitance dual pressure sensor comprising:
an enclosure;
a substrate of dielectric material within said enclosure having a first major surface and a second major surface;
a first electrode affixed to a portion of said first major surface;
a second electrode affixed to a portion of said second major surface and electrically isolated from said first electrode;
a first flexible electrode mounted in sealed relation to said first major surface of said substrate and spaced from said

first electrode forming therewith the plates of a first capacitor, with said second fixed electrode being isolated from any capacitance variances caused by said first flexible electrode;

a second flexible electrode mounted in sealed relation to said second major surface of said substrate and spaced from said second electrode forming therewith the plates of a second capacitor, said first and second flexible electrodes being movable independently of each other and electri-



cally coupled together forming a common connection, and with said first fixed electrode being isolated from any capacitance variances caused by said second flexible electrode;

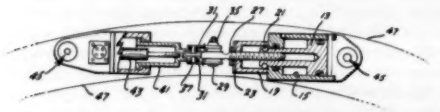
said substrate being sealably mounted within said enclosure forming therewith a first chamber external to said first flexible electrode and a second chamber external to said second flexible electrode and sealed from said first chamber; and means to communicate a variable pressure to at least one of the Chambers.

4,177,681

APPARATUS FOR ADJUSTING AND LOCKING A LINEAR ACTUATOR

Thomas B. Wess, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 6, 1978, Ser. No. 893,868
Int. Cl.[2] F16H *21/44, 21/54, 25/18*
U.S. Cl. 74—110 **3 Claims**



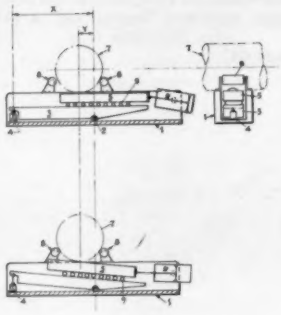
1. A linear actuator for actuation of a turbine nozzle and the like having infinite stroke adjustment and lockable at any position of its designated stroke, said actuator comprising a cylindrical actuator body, an actuator piston disposed within said actuator body for sliding movement therein, an actuator rod having a threaded portion thereon threadably attached to said actuator piston and extending outwardly therefrom, the extending portion of said actuator rod being adjustable in length, an actuator retract stop threadably attached to said actuator rod for limiting the travel of said actuator piston within said actuator body, means for locking said actuator rod in position in said actuator piston to prevent relative movement therebetween, means for locking said actuator retractor stop in position against said actuator body, load clevis attachments having openings therein in alignment with openings in said actuator rod, a shoulder bolt positioned through the aligned openings in said actuator rod and said clevis attachments, and a load piston pivotably attached to said actuator rod for linear movement therewith, whereby the load piston which is locked in position serves to control an electrical feedback precalibrated to give a known signal proportional to its stroke thereby indicating the position of the load.

4,177,682

MECHANISM AND A METHOD FOR THE SUPPORT AND STEPWISE ROTATION OF A MEMBER

Peter G. Blackman, 14 Charlesfield Rd., Rugby, Warwickshire, England, assignor to Peter George Blackman, Rugby and Associated Electrical Industries Limited, London, both of, England

Filed Oct. 11, 1977, Ser. No. 840,900
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—128 **13 Claims**



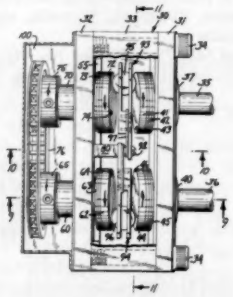
1. A mechanism for the support and stepwise rotation of a rotary member, comprising primary support means defining a stable position of said rotary member and secondary support means for lifting said rotary member off the primary support means, moving linearly a predetermined distance in a direction to allow said rotary member to roll on said secondary support means, and lowering said rotary member onto said primary support means in said stable position, the rotation of said rotary member corresponding to said predetermined distance.

4,177,683

POWER TRANSMISSION MECHANISM

Darcy C. Moses, Rush City, Minn., assignor to Darmo Corporation, Thief River Falls, Minn.

Filed Sep. 19, 1977, Ser. No. 834,279
Int. Cl.[2] F16H *13/02, 13/04*
U.S. Cl. 74—200 **17 Claims**



1. A variable ratio power transmission mechanism comprising, in combination:

a driving member rotatable about a first axis and having a flat surface perpendicular to said first axis;

a driven member rotatable about a second axis and having a flat surface perpendicular to said second axis;

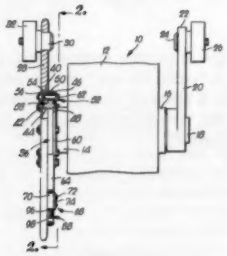
mounting means positioning said member in spaced apposition so that said surfaces define planes intersecting at an acute dihedral angle, said mounting means including ratio varying means for causing relative motion between said

members in a direction aligned with the vertex of said dihedral angle;
rolling means making contact with said surfaces along circles concentric with said axes;
and means resiliently urging said rolling means toward the vertex of said dihedral angle.

4,177,684
ANGULARLY ADJUSTABLE MOUNTING FOR SPROCKET WHEELS AND THE LIKE

Allen A. White, Peabody, and Thomas W. Ankenman, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 10, 1977, Ser. No. 823,230
Int. Cl.[2] F16H *13/10*
U.S. Cl. 74—212 **9 Claims**



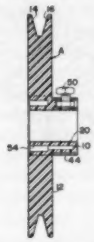
1. Power transmitting mechanism including:
a shaft rotatable about its longitudinal axis;
a rotary member; and
apparatus securing said member to the shaft in a certain angular relationship for rotation with the shaft about said axis while the member and said shaft remain held in said certain angular relationship,
said apparatus permitting selective angular adjustment of the member relative to the shaft in the plane of rotation of the member to a new angular relationship with the shaft upon temporary termination of said shaft rotation,
said apparatus including first structure movable with the shaft during said relative adjustment, second structure movable with said member during said relative adjustment, and operating means between said structures for moving the latter relative to one another to effect said adjustment,
said operating means including a pair of relatively shiftable components having interacting cam surfaces, said components being disposed to impart adjusting force to said first structure when they are relatively shifted in one direction and to relieve adjusting force from said first structure when they are relatively shifted in the opposite direction,
said operating means further including a second pair of relatively shiftable components having interacting cam surfaces, said second pair of components cooperating with said first mentioned pair of components to confine said first structure therebetween whereby relative shifting of the respective components of the two pairs may be used to effect said adjusting movement of said first structure.

4,177,685
PULLEY

Warren H. DeLancey, 1580 Prospect Ave., Elyria, Ohio 44035

Filed Feb. 13, 1978, Ser. No. 877,018
Int. Cl.[2] F16H *55/48*
U.S. Cl. 74—230.7 **12 Claims**

4. A pulley comprising a disk-like body part with a V-belt groove in its periphery or rim and a hub part extending from at least one side of said body part and having at least one external non-circular recess therein, said hub part having a shaft receiving aperture therein concentric with the V-groove in said body part and an aperture extending from the bottom of said recess or recesses to said shaft receiving aperture, non-circular nuts in the non-circular aperture or apertures in said hub part, and a ring or band member encircling said hub part and having an

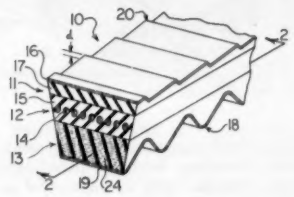


aperture or apertures therein aligned with the threaded aperture or apertures in the nut or nuts, said body and hub parts being made of a plastic and having at least the sides of the V-belt groove reinforced with glass beads or spheres for reducing pulley and belt wear.

4,177,686
ENDLESS POWER TRANSMISSION BELT

Richard J. Jacob, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 15, 1978, Ser. No. 916,026
Int. Cl.[2] G01F *1/06*
U.S. Cl. 74—231 CB **26 Claims**



1. An endless power transmission belt comprising an inner compression section, an outer tension section and a load-carrying section positioned therebetween, said tension section comprising a plurality of corrugations transverse to the endless path of said belt, said corrugations having a sawtooth shape when viewed from a side of said belt.

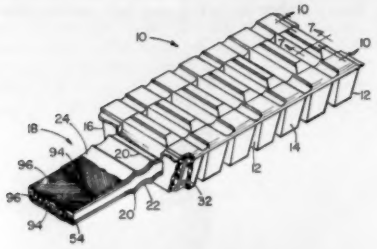
4,177,687
V-BELT

Paul E. Russ, Sr., Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 16, 1978, Ser. No. 934,122
Int. Cl.[2] F16G *5/20*
U.S. Cl. 74—231 C **18 Claims**

1. A power transmission belt comprising:
a generally flat belt type load carrying section;
a series of spaced blocks transversely positioned and attached to the load carrying section, the blocks molded of a polymeric material and having opposing V-type sides which define frictional driving surface areas; and
a reinforcement for, and of which a portion is embedded in each block, each reinforcement including upper and lower beam members positioned transversely and at opposing radial sides to the load carrying section, and diagonal side members attached to the beam members and embedded in

the blocks with a side member juxtaposed and lending support to each frictional driving surface, each reinforcement arranged so as to substantially surround and transversely support the load carrying section.



4,177,688

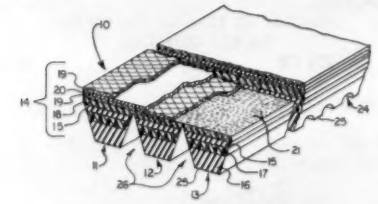
ENDLESS POWER TRANSMISSION BELT AND METHOD FOR MAKING SAME

Anderson W. Howerton, Nixa; Darrell L. Klein, and James R. Thomas, both of Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Feb. 8, 1978, Ser. No. 875,980

Int. Cl.[2] F16G 5/06, 5/22

U.S. Cl. 74—233 **11 Claims**



1. An endless power transmission belt comprising a plurality of longitudinally extending, laterally spaced belt elements, each of said belt elements being of trapezoidal cross-section and having an inner compression section, a load-carrying section and an outer tension section, and a tie band interconnecting the radially outer surfaces of said belt elements, said tie band comprising a plurality of cooperating layers, one of said layers being bonded to said radially outer surfaces of said belt elements and comprising an elastomeric matrix having a plurality of discrete elongated fibers homogeneously dispersed therethrough and oriented at an angle of about 90° to the the endless path of said belt, and another of said layers comprising a fabric layer, wherein said spaced belt elements define grooves extending outwardly from the inner surface of said belt through said compression section, load-carrying section and tension section into said elastomeric matrix of said tie band, said grooves terminating short of and spaced from said fabric layer.

4,177,689

CHAIN DRIVE, ESPECIALLY FOR THE CONTROL DRIVE OF INTERNAL COMBUSTION ENGINES

Karl Zeilinger, Berglen-Hosslinswart, and Reiner Bachschmid, Stetten-Rommelshausen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

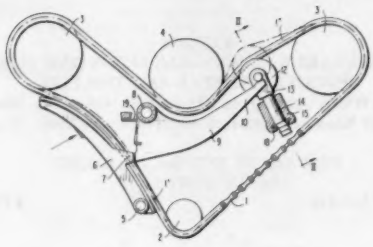
Filed Dec. 5, 1977, Ser. No. 857,693

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655102

Int. Cl.[2] F16H 7/08, 7/12

U.S. Cl. 74—242.8 **16 Claims**

1. A timing control chain drive of an internal combustion engine which includes one driving chain wheel and at least two driven chain wheels with a drive chain passing around the driving and driven chain wheels, and a first chain tensioning means engaging at a non-loaded section of the drive chain, characterized in that a further chain tensioning means is provided which engages at another section of the drive chain, and in that means are provided for operatively connecting the first and further chain tensioning means whereby a tensioning movement of the further tensioning means is derived from the first tensioning means.



4,177,690

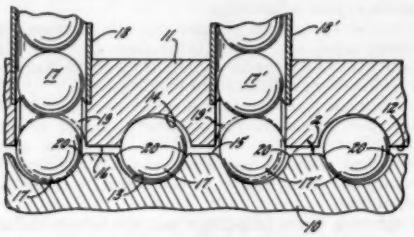
BALL SCREW AND NUT

Hubert E. Klinkenberg, Rochester, Mich., assignor to Beaver Precision Products, Inc., Beloit, Wis.

Filed Feb. 22, 1978, Ser. No. 880,088

Int. Cl.[2] F16H 1/18

U.S. Cl. 74—424.8 R **3 Claims**

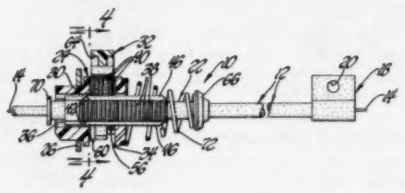


1. In a helical ball screw and nut mechanism, the combination of, a screw having an external helical ball groove of generally semi-circular cross-section, lands formed on said screw and separating adjacent convolutions of said groove, a nut telescoped on said screw and having an internal helical ball groove registering with the groove in said screw to define a ball path, said nut having a return passage having two ends each communicating with said path, the ends of said passage being spaced axially from each other whereby the passage and the portion of the path between said ends define a closed circuit with the path forming the active portion of the circuit and the passage forming the inactive portion, a plurality of balls disposed in and filling said circuit and the nut and screw being preloaded whereby the balls in said active portion bear against one side wall of the generally semi-circular cross section of the groove in said screw and against the opposite side wall of the groove in said nut, and inclined surfaces between the tops of said lands and the side walls of the groove in said screw to unload said balls as the balls travel into and out of said active portion of said circuit, said surfaces being inclined relative to the axis of said screw at an acute angle in the range of 30 to 60 degrees.

4,177,691
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

F. Lawrence Fillmore, Birmingham, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Mar. 6, 1978, Ser. No. 883,458
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 P 16 Claims

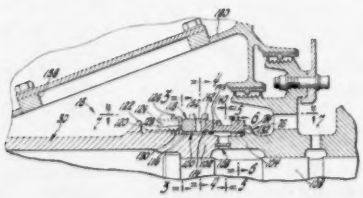


1. A motion transmitting remote control assembly comprising; a conduit, a core element movably supported by said conduit with the ends thereof extending from the ends of said conduit, a fitting adjacent a first end of said conduit for attaching said conduit to a support structure, adjustment means attached to said conduit adjacent the second end thereof, support means adapted for attachment to a support structure, locking means supported by said support means for movement between engaged and disengaged positions for allowing relative movement between said adjustment means and said support means in a direcion longitudinally of said conduit when in said disengaged position and for preventing said relative movement when in said engaged position, said adjustment means having a plurality of straight irregularities disposed therealong and extending transversely to the longitudinal axis of said conduit, said locking means having a plurality of straight irregularities of coacting with said irregularities on said adjustment means when in said engaging position, said adjustment means comprising an elongated member having oppositely facing parrallel sides, said irregularities being disposed in side by side relationship along said sides, and guide means defined by a passageway extending through said support means with said elongated member disposed therein for guiding the movement of said elongated member relative to said support means while preventing rotation of said elongated member relative to said support means.

4,177,692
SHAFT BALANCING

John A. Irwin, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,759
Int. Cl.[2] F16F *15/22*
U.S. Cl. 74—573R 1 Claim

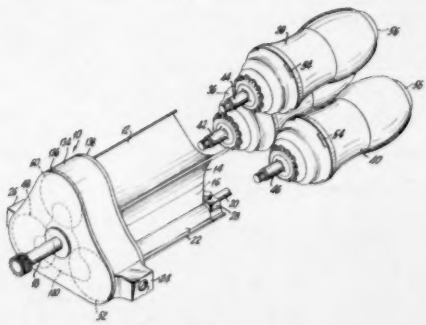


1. A gas turbine engine rotor shaft balancing assembly comprising: a shaft having first and second segments each having an outer peripheral surface thereon spaced from one another, a coupling joining said shaft segments, one of said shaft segments including a plurality of external splines at one end thereof, a first balance ring having a first precise unbalance located thereon, said first balance ring having a first smooth inner bore at one end thereof supportably received on the peripheral surface of the other of said shaft segments and internal splines at the opposite end thereof and for axial adjustment into and out of interlocked engagement with said external splines, a second balance ring having a second smooth inner bore throughout its axial length slidably supported on the peripheral surface of the other of said shaft segments and having a second precise unbalance thereon, coacting serration means on said first and second balance rings for axially joining and separating said first and second balance rings for rotatable adjustment relative to one another to circumferentially locate said first and second unbalances at a relatively fixed rotatable joined position therebetween, said first and second balance rings when in their joined position having their smooth inner bores rotatable on said other of said shaft segments when said first balance ring is out of interlocked engagement with said external splines thereby to circumferentially position said relatively fixed joined first and second balance rings with respect to said shaft for correcting shaft unbalance, means for shifting said first and second balance rings axially on said shaft when said relatively fixed first and second precise unbalances are rotatably adjusted with respect to the shaft to balance said shaft, a housing surrounding said shaft and said first and second balance rings thereon accessible from exteriorly of said engine and including an access port therein overlying said shaft and said first and second balance rings thereon, a removable panel on said housing covering said access port to prevent the entrance of foreign matter interiorly of said housing, said panel being removable whereby said first and second balance rings can be adjusted both axially and rotatably both with respect to one another and with respect to said shaft to produce in situ balancing of the shaft without disassembly from an axially fixed running location within a gas turbine engine.

4,177,693
DRIVE SYSTEM

Theodore Ivanko, Fairfield, and Michael S. Saboe, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jun. 22, 1978, Ser. No. 917,981
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—661 10 Claims



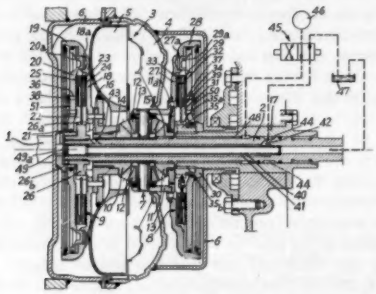
1. A drive system comprising:
three engines each ofwhich has separate drive means;
a unitary "y" shaped firewall to separate the engines from each other;
a gear box to which said engines are mounted with their drive means operatively connected to gear means within said gear box, said firewall being also supported by said gear box to maintain the separation of the engines up to the face of said gear box, said gear box having idler gears operatively connecting the drive means of the three engines to an output drive train of said gear box.

4,177,694

TRANSMISSION MECHANISM WITH HYDROKINETIC COUPLING DEVICE AND REVERSING DEVICE

Henri G. Lachaize, Fontenay-aux-Roses, France, assignor to Société Anonyme Automobiles Citroen, Paris, France

Filed Sep. 6, 1977, Ser. No. 830,995
Claims priority, application France, Sep. 9, 1976, 76 27171
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—732 7 Claims



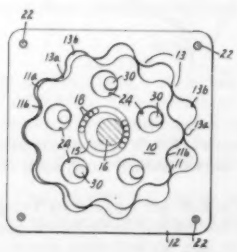
1. A transmission mechanism, more particularly for an automobile, disposed between a driving shaft and a driven shaft comprising in a fixed support structure, a hydrokinetic device for coupling said driving and driven shafts, said device including a closed enclosure provided with a driving wheel therein remote from said driving shaft, said enclosure being rigidly locked with said driving shaft and fluid-filled, a driven wheel located within said enclosure adjacent of said driving wheel and which can be coupled to an end of said driven shaft located in said enclosure and in axial alignment with said driving shaft by means of a reversing device comprising a planetary gear set of bevel gears located substantially at the center of the enclosure and the driving gear of which is keyed to said driven wheel, the driven gear of which is keyed on said driven shaft, said driving gears meshing with at least one planet wheel carried by a planet wheel holder which is freely rotatable with respect to the driven shaft, the coupling of said driving wheel and said driven shaft being controlled by hydraulically controlled coupling means located in said enclosure between said driving gear and said driven shaft and between said planet wheel holder and a part of said fixed support structure.

4,177,695

ROTARY SPEED CHANGER

Leslie H. Grove, 707 E. Hoyt Ave., St. Paul, Minn. 55106

Continuation-in-part of Ser. No. 583,595, Jun. 4, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,919
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—80.4 11 Claims



1. An efficient, economical rotary speed changer comprising a housing containing

(a) a 2-element internal gear set, the inner element having n external teeth and the outer element having n+1 internal teeth, all of which are in substantial contact with the facing external teeth,

(b) a crankshaft journalled in the housing coaxially with said outer element and having an eccentric journalled in an opening on the axis of the inner element,

(c) the inner element having m cylindrical cycloid holes or pins centered on and equally spaced along a circle centered on its axis, n and m each being integers, n being at least three,

(d) a plate having a cylindrical cycloid pin or hole mating with each hole or pin of the inner element, the diameter of each cycloid hole exceeding the diameter of the mating pin plus twice the eccentricity of the crankshaft-eccentric,

(e) the ratio of the root diameter of the inner element to the eccentricity being at least 9 to 1, and

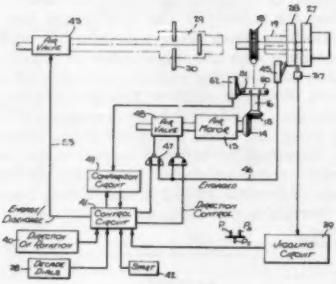
(f) one of said plate and outer element being fixed to the housing and the other free to rotate at a reduced speed relative to that at which the crankshaft rotates.

4,177,696

ANGULAR INDEXING MECHANISM FOR ORIENTING WORKPIECE

Lester I. Moss, Hackensack, N.J., assignor to Mosstype Corporation, Waldwick, N.J.

Filed Jan. 22, 1976, Ser. No. 651,535
Int. Cl.[2] B23Q *17/18*
U.S. Cl. 74—826 10 Claims



1. In a mechanism provided with a multiple-tooth face gear coupling pair wherein the first gear in the pair is arranged to be rotatable and the second gear to be non-rotatable, reversible motor means being associated with said first gear to cause it to assume a desired angular position, the second gear being axially retractable and advanceable with respect to the first gear whereby when the second gear is retracted, the first gear is free to rotate, and when the second gear is advanced into meshing relationship with the first gear, the position of the first gear is locked against rotation, a system for bringing about a condition of full intermeshing engagement between the face gears, said system comprising:

(A) means operatively coupled to said second gear to sense a point in the advance thereof at which the second gear is a few mils somewhat shy of full engagement with the first gear to produce a control signal; and

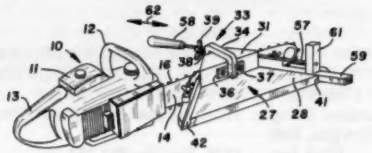
(B) means responsive to said control signal to initiate a jiggling action in each phase of which the motor means for the first gear is momentarily reversed in direction to slightly turn the first gear to permit an incremental advance of the second gear to a point still closer to full engagement, said jiggling action continuing until a condition of full engagement is attained.

4,177,697

APPARATUS FOR SHARPENING A CHAIN SAW

Edward C. McDunn, Barnesville, Minn. 56514

Filed Dec. 2, 1977, Ser. No. 856,999
Int. Cl.[2] B23D *63/16*
U.S. Cl. 76—25 A 28 Claims



1. An apparatus for sharpening the cutting teeth of a chain saw having a blade and a chain movably mounted on the blade, said chain having teeth operable to cut material, as wood, each tooth having a forward cutting edge, comprising: a base, means mounted on the base operable to hold the base on the blade, a rod file having a forward end and a handle end, an elongated non-rotatable slide, means connecting the forward end of the file to the slide, said handle end of the file being free to be moved in a direction whereby the file can be moved into engagement with the forward cutting edge of a tooth, said base having linear surfaces forming at least one linear groove providing guide means for accommodating the slide for movement along the linear path of said groove, said slide having linear external surfaces located in sliding engagement with surfaces of the base forming the groove therein whereby the slide and file can be moved in opposite directions along said linear path, said guide means locating the slide at an angle relative to the side of the blade to position the rod file at an angle relative to the forward cutting edge of a tooth of the chain, and holding means mounted on the base engageable with said tooth of the chain to hold the tooth in a fixed position and to align the file with the forward cutting edge of said tooth, said holding means extended in the general longitudinal direction of the file means and having a portion engageable with the side of the tooth that is to be sharpened whereby the rod file can be moved along said linear path to sharpen the forward cutting edge of said tooth.

4,177,698

FINGER FIT IMPLEMENT

Lillian L. Greneker, 321 E. 69th St., Apt. 1E, New York, N.Y. 10021

Filed Mar. 24, 1978, Ser. No. 889,735
Int. Cl.[2] B25B *9/00*
U.S. Cl. 81—1 R 7 Claims

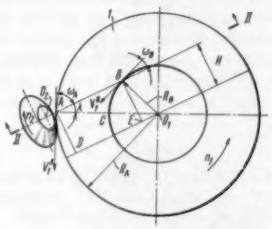
1. A finger fit implement comprising a shaped hollow member, one end of which forming an opening to accomodate the entry of a finger, and having an interior shape including a top portion generally parallel to the axis of said member and a lower portion off centered and tapered with respect to said axis of said member and joining said top portion forming a closed end of said member; an external fitting means for accomodating an element for manipulation by said finger, said fitting means positioned in axial alignment with said top portion of said opening and secured to said member at the point where said top portion and said tapered lower portion join, said fitting including a bevelled inner surface generally parallel to said tapered lower portion of said member providing a conforming fit on said finger thus increasing manipulability and fit, a plurality of rigid segments positioned at circumferentially spaced positions about said hollow shaped member, said segments digitally engageable for manipulation support of said member, and providing the area of said implement about the central portion of the finger of relatively thin material so as to be transmissive of pressure and thereby provide an area for increased touch sensitivity.

4,177,699

METHOD OF MACHINING END FACES

Stanislav A. Dovnar, ulitsa Koltsova, 18/1, kv. 79; Valery A. Sidorenko, Leninsky prospekt, 14, kv. 3; Evgeny I. Morgunsky, ulitsa Malaya, 15, kv. 1, and Nikolai V. Vishnev, ulitsa Karastoyanovoi, 23, kv. 82, all of Minsk, U.S.S.R.

Filed Jun. 21, 1978, Ser. No. 917,579
Int. Cl.[2] B23B *3/00;* B23C *1/00*
U.S. Cl. 82—1 C 1 Claim



1. A method of machining end faces with rotary tools comprising the steps of:

imparting to the workpiece a rotary motion;

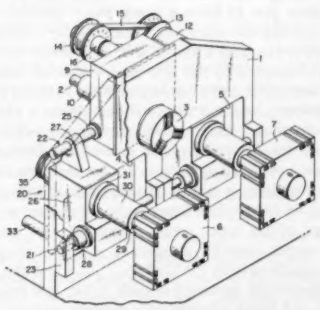
imparting to the tool a straight motion at an angle 20°–75° to the radius of the workpiece.

4,177,700

TURNING MACHINE TOOL

Eberhard van der Horst, Erkelenz, Fed. Rep. of Germany, assignor to A. Monforts, Monchengladbach, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,111
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718479
Int. Cl.[2] B23B *3/00, 3/34*
U.S. Cl. 82—2 R 14 Claims



1. Turning machine tool comprising a workpiece spindle, a cantilevered longitudinal guide adjacent said workpiece spindle and movable parallel to the rotary axis thereof, at least one tool support mounted on the free end of said cantilevered longitudinal guide and being movable in a horizontal plane

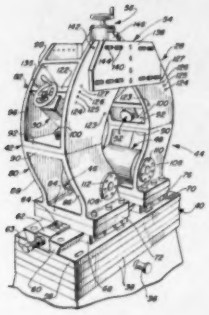
perpendicularly to said rotary axis of said workpiece spindle within a work space for the turning machine tool, guide means for said cantilevered longitudinal guide, and a round guide system comprising two transverse guides movable perpendicularly to said rotary axis of said workpiece spindle, said cantilevered longitudinal guide being supported outside said work space through the intermediary of said guide means in said round guide system.

4,177,701

STEADY REST FOR USE IN APPARATUS FOR SUPPORTING AND PRECISION-TURNING OF LARGE ROTARY DEVICES

Siegfried Schulz, Rolling Meadows, Ill., assignor to Dieter Christoph, Streamwood, Ill., a part interest

Filed Sep. 5, 1978, Ser. No. 939,322
Int. Cl.[2] B23B *15/00, 3/00, 5/28*
U.S. Cl. 82—39 **23 Claims**



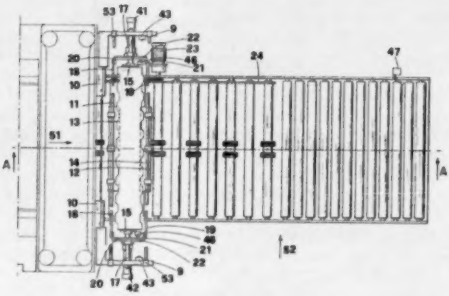
23. In an apparatus for supporting and turning a large rotatable work piece, said apparatus having a base, a cutter support mounted on the base for holding a cutter in position adjacent to the work piece, the improvement comprising: a pair of steady rests mounted on said base for rotatably supporting the work piece; each of said steady rests including; a pedestal having a tower mounted on the base; fasteners releasably securing the tower to the base; a plurality of adjustment plates mounted on the pedestal; a jaw support mounted on the adjustment plates, said jaw support including a pedestal plate, a lead screw rotatably mounted on the pedestal plate, a pair of pivot nuts threaded on the lead screw, and a jaw base connected to each of the pivot nuts and movable therewith; a C-shaped jaw mounted on each jaw base, each C-shaped jaw positioned in a substantially upright attitude with the open side of each jaw facing the other jaw to form a work piece opening therebetween for receiving the work piece, each of the C-shaped jaws having an upper jaw and a lower jaw, each lower jaw having a base plate connected to the jaw base, a pair of roller plates fixed to the base plate, and a connector plate forming the upper end of the lower jaw fixed to the roller plates, a plurality of removable extension plates secured to the connector plate of the lower jaw for determining the size of the C-shaped jaw, said upper jaw having an upper jaw connector plate connected to the extension plates, a pair of side plates fixed to the connector plate, and an upper plate fixed to the side plates adjacent to the upper end of the upper jaw; a removable jaw bridge connecting the upper jaws to complete a circle around a work piece in cooperation with the C-shaped jaws and the jaw support; a support roller mounted in each lower jaw between the roller plates and being adpated to rotatably engage the work piece; a brake mounted in each upper jaw, each brake including a brake plate pivotedly mounted between the side plates of the respective upper jaw for angularly positioning the brake, a brake housing secured to the brake plate, a brake screw rotatably mounted in the brake housing, a brake nut threadedly engaging the brake screw and a brake pad mounted on the brake nut for engagement with the work piece; and a shaft stabilizer mounted on the removable jaw bridge, said shaft stabilizer including a stabilizer roller being vertically adjustable for engagement with the work piece to hold the work piece in engagement with the support rollers supporting the work piece.

4,177,702

DEVICE FOR AUTOMATICALLY FORMING PILES OUT OF STRIPS EXITING FROM A MACHINE ON WHICH THE SAID STRIPS ARE PRODUCED

Luigi Pazzaglia, Bologna, Italy, assignor to Officine Cevolani S.p.A., Bologna, Italy

Filed Jun. 1, 1978, Ser. No. 911,392
Claims priority, application Italy, Jun. 21, 1977, 3479 A/77
Int. Cl.[2] B65G *57/06*; B21D *43/22*
U.S. Cl. 83—79 **7 Claims**



1. Device for automatically forming piles out of strips exiting from a machine on which the said strips are produced, the latter being, a machine of the type that comprises a horizontal table for supporting a sheet to be divided up into strips that is being fed to a cutting device for shearing the said strips perpendicularly to the infeed direction of the said sheet, essential features of the device in question being that it comprises in conjunction: two rods placed downstream of the said cutting device, perpendicualrly to the direction in which the said strips exiting therefrom move forwad, these being parallel one to the other, and supported, through two brackets placed roughly at the extremities of the said rods, by the bed of the said machine, the said rods, each rotatable around its own axis, being movable with respect to one another to suit the width of the sheared strips, each of the said rods being provided with at least one first support member, in an almost central position, provided to sustain the pack of strips in a roughly horizontal position exiting from the aforementioned cutting device resting on one another, the said brackets each being provided with a limit member defining a vertical wall extending below the said rods, on a plane parallel to the direction in which the said strips move forward, the said limit members being provided for the purpose of restraining and guiding the said strips, it being possible to position the said brackets with respect to one another to suit the length of the sheared strip, each of the said limit members being provided with second support members, in the region of the plane defined by the said first support members, on which the said strips can rest in packs and be sustained jointly with the said first support members; means for operating the said rods and for rotating them in opposite directions between two extreme positions, that is to say, the support position and the release position for the pack of strips resting on the said support members, the said operating means being actuated to suit a predetermined number of strips exiting from the said cutting device; a driven endless conveyor placed downstream of the machine, beneath the said rods, movable in a direction parallel to and in harmony with that in which the strips exiting from the cutting device move forward, this de-

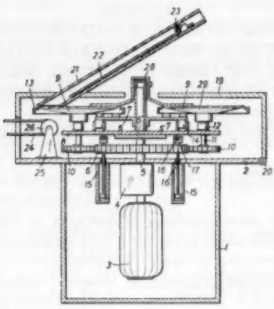
signed to accept in succession the packs of strips dropping out of the said rods, until a vertical pile of strips has been formed and to then carry the said pile towards a discharge station; first sensor means placed between the said rods and the said conveyor, to detect when a height pre-established for the pile of strips has been reached, and to consequently cause the said cutting device to cease operating and the said conveyor to subsequently be actuated; and second sensor means placed at the side of the said conveyor, to detect that the said conveyor has undergone in the aforementioned direction a displacement at least equal to the width of the pile and to cause, in consequence, the endless conveyor to halt and the said cutting device to resume operation.

4,177,703

SLICING MACHINE FOR SALMON

Adolf J. J. F. Cavier, Flerrentwiete 49a, 2000 Hamburg 56, and Rudolf Maass, Bahrenfelder Chaussee 73, 2000 Hamburg 50, both of Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,749
Int. Cl.[2] B26D *4/38*
U.S. Cl. 83—356.3 **5 Claims**



1. A salmon slicing machine comprising a frame, a stationary sun gear and a rotatable shaft mounted on said frame, a stop plate and circular supporting parts having circular grooves mounted for rotation on said rotatable shaft, circular knives positioned under said circular supporting parts and mounted for horizontally rotating and orbiting around said stationary sun gear, means to adjust said stop plate relative to said circular knives and a feeding means for the material to be sliced inclined at an acute angle to the plane of rotation of the knives.

4,177,704

PORTABLE SAW MILL

Rae Randle, Breynat, Canada (T0A 0P0)

Filed Nov. 28, 1977, Ser. No. 855,348
Claims priority, application Canada, Nov. 26, 1976, 266697
Int. Cl.[2] B27B *7/04*
U.S. Cl. 83—435.1 **9 Claims**

1. A portable saw mill for cutting logs into small dimension lumber, comprising, in combination:

(a) a rigid frame providing a lower base;

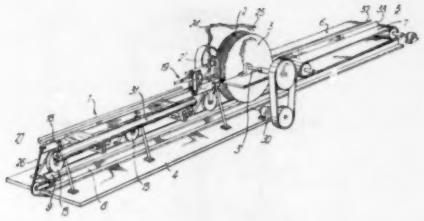
(b) a longitudinally extending rigid rail mounted on said base;

(c) a carriage reciprocally mounted on said rail, said carriage having an upper surface for supporting a log to be cut;

(d) a pair of arbors mounted on said base for rotation about parallel axes normal to said horizontal rail and each having a circular saw blade mounted thereon for cutting a log carried by the movable carriage;

(e) means for moving said saw blades towards and away from each other to vary the spacing therebetween, and having a selected minimum spacing slightly larger than the width of the movable carriage, whereby the carriage can pass between the saw blades during cutting of a log carried thereby;

(f) log hold down means mounted on said carriage clampingly to press the log onto the log supporting upper surface thereof and dimensioned to pass between said saw blades during reciprocal movement of the carriage; and



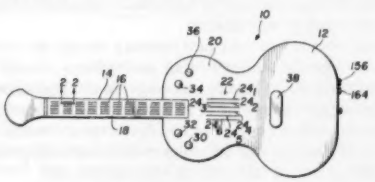
(g) guide means for guiding the carriage during reciprocal movement thereof along the rail, said guide means engaging the carriage at a position below the log supporting surface thereof; said combination providing a lightweight, rigid portable saw mill having no supporting structure located in a plane above the movable carriage so as to permit unobstructed viewing of a log during cutting.

4,177,705

STRINGLESS ELECTRONIC MUSICAL INSTRUMENT

Fred J. Evangelista, 14 Linda La., Severna Park, Md. 21146

Filed Dec. 28, 1978, Ser. No. 973,801
Int. Cl.[2] G10H *1/00, 1/02*
U.S. Cl. 84—1.16 **14 Claims**



1. In an electronic musical instrument for simulating a stringed instrument having a body portion adapted to carry tone generating means and a neck portion adapted to carry a finger-board assembly coupled to said tone generator means and being operable to vary the tonal output thereof, the improvement comprising:

tone generator means including an electrical oscillator circuit for each fundamental frequency desired to be simulated and including switch operated circuit means operable from said fingerboard assembly for selectively changing the tonal output frequency of said oscillator circuit;

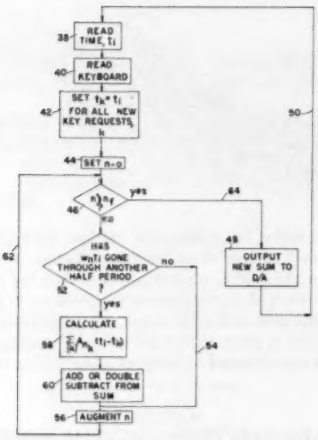
a respective output amplifier circuit coupled to said oscillator circuit and being energized in accordance with the operative state of a player actuated switch device; and

said player actuated switch device consisting of a relatively thin flexible blade-type switch actuator member mounted on edge in a substantially upright position on the outer surface of said body portion adjacent said fingerboard assembly, being adapted thereby to be deflected bi-directionally transverse to said upright position when strummed, struck, picked or plucked or bowed by a player, and at least one pair of electrical switch contacts located on each side of said actuator element, wherein deflection of said actuator element in either direction operates one of said pair of switch contacts to energize said output amplifier circuit.

4,177,706
DIGITAL REAL TIME MUSIC SYNTHESIZER

Alan J. Greenberger, #8 Hart Ave., Hopewell, N.J. 08525

Continuation-in-part of Ser. No. 721,447, Sep. 8, 1976, abandoned. This application Jul. 7, 1978, Ser. No. 922,803
Int. Cl.[2] G10H *1/06, 5/10*
U.S. Cl. 84—1.01 **11 Claims**



1. A musical synthesizer wherein musical waveshapes are synthesized comprising:

first memory means for storing a set of transient envelope waveshapes and a set of harmonic frequencies constituting said musical waveshapes;

means coupled to said first memory means for comparing and digitally approximating said musical waveshapes by the summing of square wave signals into digitalized waveform approximations of said musical waveshapes;

selecting means coupled to said first memory means a plurality of each of said selecting means controlling the initiation of one of said musical waveshapes; and

means coupled to said selecting means and said first memory means for non-periodically computing said musical waveshapes dependent upon the state of any of said selecting means, said computing means including signal information derived from the state of said selecting means.

4,177,707
ELECTRONIC MUSIC SYNTHESIZER

Gary R. Boucher, 11831 S. Willow Cir., Houston, Tex. 77071

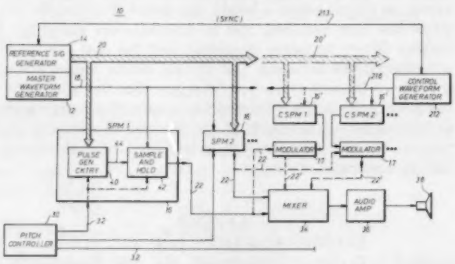
Continuation-in-part of Ser. No. 601,509, Aug. 4, 1975, abandoned. This application May 2, 1977, Ser. No. 793,126
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **25 Claims**

1. An electronic sound synthesizer for generating a selected signal waveform at a desired audio frequency F2, comprising:

(a) a signal generator for generating a periodic signal at a relatively higher frequency F1 than the audio frequency F2 and having a waveshape similar to that of said desired signal waveform;

(b) a sampling circuit for repetitively sampling said periodic signal to thereby provide a series of samples, successive ones of the samples being produced by sampling said periodic signal at a rate of approximately once per a given cycle at instantaneous points in the cycle which are progressively displaced from the previously sampled points;

(c) a storage mechanism for storing said samples; and

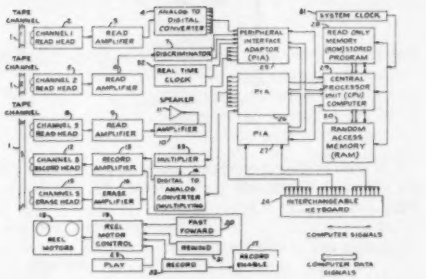


(d) means for sequentially recombining each of said samples to thereby produce said selected waveform at the desired audio frequency F2.

4,177,708
COMBINED COMPUTER AND RECORDER FOR MUSICAL SOUND REPRODUCTION

Rochelle Pinz, 2100 Atlantic Blvd., Atlantic Beach, N.Y. 11509, and Gordon Silverman, New York, N.Y., assignors to Rochelle Pinz, Atlantic Beach, N.Y.

Filed Jun. 17, 1977, Ser. No. 807,733
Int. Cl.[2] G10H *3/04*
U.S. Cl. 84—1.28 **6 Claims**



1. A device for storing samples of musical tones and reproducing and recording sustained tones, chords and melodies, said device comprising:

first recording means including a multiplicity of samples of tones produced by some musical instrument previously recorded on said first recording means,

first conversion means for the conversion of said multiplicity of samples of tones from said first recording means into electrical signals,

amplification means for the amplification of said electrical signals,

a second conversion means for the conversion of said amplified electrical signals into a multiplicity of pulse signals whose states are equivalent to said tone samples,

a second recording means which includes a multiplicity of address and reset signals in correspondence with said multiplicity of tone samples on said first recording means,

a third conversion means for the conversion of said address and reset signals into electrical address and reset signals,

a second amplification means for the amplification of said electrical and reset signals,

discriminator means for the separation of said electrical address and reset signals into a distinct address signal and a distinct reset signal,

keyboard means adapted to produce signals which deter-

mine which of said tone samples should be used to produce a sustained tone or tones,
read only memory means which stores the sequence of operations by which said device accepts signals from said keyboard and accepts said samples of tones and produces a sustained sequence of tone or tones,
random access memory means which stores said pulse signals from said second conversion means and which stores signals from said keyboard means,
central processor means for receiving signals from said read only memory means and producing control signals for the reproduction of said sustained tone or tones,
system clock means which includes time signals to determine when said control signals from said control processor means are to be produced,
a fourth conversion means for the conversion of a second multiplicity of pulse signals initiated by said central processor means, said second multiplicity of pulse signals being representative of the time course of a note or notes into a continuous electrical signal equivalent to the state of said second multiplicity of pulse signals,
a third amplification means which amplifies said continuous signal representative of the time course of a note or notes,
a fifth conversion means for the conversion of said continuous signal representative of the time course of a note or notes into a magnetic signal equivalent to said continuous electrical signal,
multiplier means for the adjustment of the magnitude of said continuous electrical signal being produced by said fifth conversion means,
a third recording means to store said magnetic signal,
a fourth amplification means for the amplification of signals from said fifth conversion means,
audio means for the reproduction of the signal produced by said fourth amplification means,
erasure means to produce an electrical erase signal to convert signals on said third recording means to a form which will not induce response in said first conversion means,
a sixth conversion means to convert said electrical erase signal to a magnetic signal representative of said electrical erase signal,
reel motor means for the forward and backward movement of said recording means, said second recording means and said third recording means,
fast forward control means to initiate forward movement of said reel motor means,
rewind control means to initiate backward movement of said reel motor means, and
record means whereby amplification is initiated by said third amplification means and whereby electrical erase signal is initiated by said erasure means.

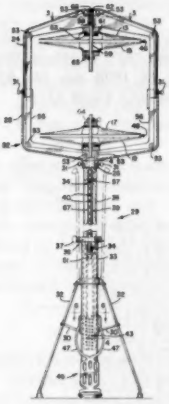
4,177,709

MOUNTING FOR TWO PAIRS OF CYMBALS

Michael E. Adams, 6409 N. Newgard, Chicago, Ill. 60626

Continuation-in-part of Ser. No. 924,998, Jul. 17, 1978. This application Sep. 29, 1978, Ser. No. 946,740
Int. Cl.[2] G10D *13/06*
U.S. Cl. 84—422 R **25 Claims**

1. A percussion musical instrument comprising:
a telescoping stand;
a frame removably mounted to said stand and movable therewith;
a spring-biased first rod disposed within said stand and movable therein;
a pair of lower twin cymbals spaced apart in a facing relationship one above the other along said first rod within said frame, the lower one of said lower twin cymbals being fixed to said frame, and the upper one of said lower twin cymbals being adjustably fixed to said first rod and movable therewith;
a second rod disposed at the top of said frame and movable therein;
a pair of upper twin cymbals spaced apart in a facing relationship one above the other along said second rod within said frame, the upper one of said upper twin cymbals being fixed to said frame, and the lower one of said upper twin cymbals being adjustably fixed to said second rod and movable therewith;
connecting means connecting said first rod to said second rod for unitary movement thereof; and,



pedal means attaching to said first rod for moving said first rod up and down within said stand, said connecting means moving said second rod in unison with said first rod, whereby the upper one of said lower twin cymbals and the lower one of said upper twin cymbals move in unison with the operation of said pedal means.

4,177,710

BLIND FASTENER

Josip Matuschek, Newport Beach, and Rene' A. Chister, Costa Mesa, both of Calif., assignors to Townsend Textron, Santa Ana, Calif.

Continuation-in-part of Ser. No. 807,366, Jun. 17, 1977, abandoned. This application Jul. 29, 1977, Ser. No. 820,156
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—70 **2 Claims**

1. A fastener for firmly securing together workpieces of composite thickness ranging from a predetermined minimum to a predetermined maximum comprising in combination,
a tubular sleeve having a head at one end and adapted to extend through aligned openings in said workpieces with said head abutting one of said workpieces, and
a mandril having a cylindrical body within said tubular sleeve and formed with a head on said body in engagement with the other end of said sleeve,
said tubular sleeve being formed with a uniform outside diameter throughout its length and with a uniform fixed inside diameter from said head to approximately the point on said sleeve of said predetermined minimum composite workpiece thickness, said inside diameter increasing at a

uniform rate from said point to said other end of said sleeve,

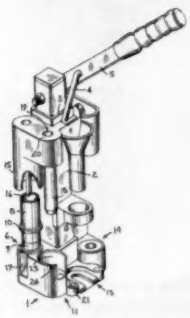
said mandril body being formed with a cylindrical outside surface substantially complemental of the inside surface of said sleeve to prevent inward collapsing movement of all portions of said sleeve upon application of longitudinal compressive force thereto.

4,177,711

SHOTGUN SHELL LOADING

Richard J. Lee, Highway "U", Hartford, Wis. 53027

Filed Aug. 28, 1978, Ser. No. 937,083
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—38 **5 Claims**



1. In a device for loading a shotgun shell having a head thereon, the combination comprising:

(a) a base defining first and second stations for supportingly receiving a shell,

(b) vertically movable ram means disposed above said first station for removing an old primer from said shell and applying a sizing ring to the shell head,

(c) a supporting surface at said second station,

(d) a vertically movable priming post disposed above said supporting surface, said post having an exposed top end,

(e) a vertical passage disposed in said post and extending from said exposed top end to the lower post end so that a new primer may be dropped by gravity therethrough onto said supporting surface,

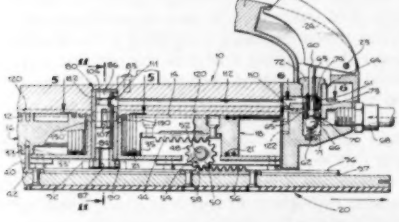
(f) and means to move said post downwardly toward said surface to drive the shell onto said new primer.

4,177,712

AIR DRIVEN TOOL WITH DOUBLE-ENDED ALIGNED PISTONS OPPOSITELY DRIVEN

Albert M. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90210

Filed Mar. 10, 1978, Ser. No. 885,177
Int. Cl.[2] F01L *33/04*; F01B *9/00, 7/02, 7/16*
U.S. Cl. 91—179 **12 Claims**



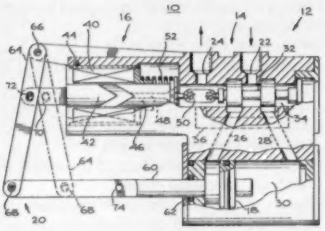
12. A pneumatic motor including a pair of tandemly mounted reciprocating pistons and a reciprocating carrier connected directly to one of the pistons for direct drive thereof in the same direction as said one piston, means including a rack and pinion connection between the other piston and the carrier, a source of fluid pressure and valve means for alternately supplying and exhausting fluid pressure to opposite ends of the pistons for driving them, channel means communicating with the said valve means for delivering fluid pressure, alternately to respective first ends of the pistons and then to respective second ends of the pistons and for exhausting fluid alternately from respective first ends of the pistons and from respective second ends of the pistons.

4,177,713

ELECTROHYDRAULIC PROPORTIONAL ACTUATOR APPARATUS

Leon D. Lewis, Palos Verdes; Wilfried Wiher, Redondo Beach, and Warde L. Parker, Rancho Palos Verdes, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 576,611, May 12, 1975, Pat. No. 4,044,652.
This application Jul. 18, 1977, Ser. No. 816,774
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 R **30 Claims**



1. Electrohydraulic proportional actuator apparatus comprising:

a rotary valve and rotary hydraulic actuator mounted and interconnected within a housing, the valve having a torque signal input shaft including a hollow portion defining a longitudinally extending first fluid passage and a sleeve member surrounding the shaft hollow portion and spaced from the shaft outer surface by spacing means to define a longitudinally extending, circumferential second fluid passage, the actuator having an output shaft coupled to a motive member, the spacing means comprising a pair of tubular spacers at opposite ends of the second fluid passage;

means for coupling the valve to a supply of pressurized fluid, the valve being movable relative to the motive member between a null position and respective flow positions for applying pressurized fluid via one of said first and second passages selectively to one side or the other of the motive member;

a transducer coupled to drive the valve to a selected flow position corresponding to an electrical signal applied to the transducer; and

means response to the movement of the motive member for restoring the valve to its null position upon the motive member reaching a position corresponding to the electrical signal applied to the transducer.

4,177,714

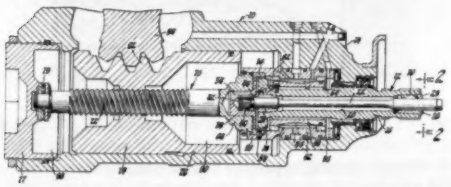
TORSION BAR FOR POWER STEERING GEAR

Floyd A. Schluckebier, Vassar, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1977, Ser. No. 844,624
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **2 Claims**

1. A power steering gear comprising a housing, a stub shaft

forming first rotatable means mounted for turning movement in said housing, an output operatively mounted for turning movement in said housing and extending outwardly therefrom, hydraulically powered actuator means operatively mounted in said housing for moving said output, said actuator means having gear means drivingly connected to said output so that said output moves in response to movement of said actuator means, valve means in said housing operatively connected to a source of pressurized hydraulic fluid selectively movable to effect the hydraulic powered movement of said actuator means and said output, said valve means comprising a valve body member and a spool member, threaded means forming second rotatable means operatively connecting said actuator means to said valve body member and said stub shaft for mechanically mov-



ing said actuator means in said housing, torsion bar means having a cylindrical end portion extending into said stub shaft providing a centering spring interconnection between said valve body and spool members, and first fastener means formed by a resilient and tapered thin-walled sleeve having a longitudinal slot extending through the wall thereof, said sleeve being operatively disposed around said cylindrical end of said torsion bar means for securing said cylindrical end to one of said rotatable means, second fastener means including a deformable locking sleeve operatively securing the other end of said torsion bar to the other of said rotatable means to permit winding of said torsion bar and the relative turning of said valve members in response to rotation of said stub shaft for the hydraulic powered movement of said actuator means and said output.

4,177,715

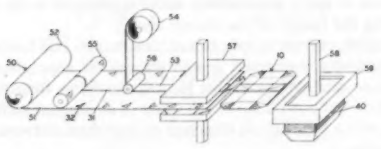
METHOD OF MAKING PARTITIONED TRAY

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 796,220, May 12, 1977, Pat. No. 4,081,125. This application Jan. 20, 1978, Ser. No. 870,989

Int. Cl.[2] B31B *17/00*

U.S. Cl. 93—37 R **2 Claims**



1. The method of making a paperboard tray, comprising the steps of:

(a) feeding a first paperboard web from a roll;

(b) feeding a second narrower paperboard web over said first web;

(c) adhering said webs in mated relation at selected areas; and

(d) cutting and scoring said mated webs to form said first web into,

(1) a rectangular bottom panel defined by a pair of side score lines and a pair of primary end score lines,

(2) a pair of end walls hingedly connected to said bottom panel along said primary end score lines,

(3) a pair of side walls hingedly connected to said bottom panel respectivley along said pair of side score lines, and

(4) four corner tabs for connecting said end walls and said side walls together to form a tray body,

and to form said second web into,

(5) a divider panel having a main portion overlaying and coterminous with said bottom panel and having a pair of end portions respectively overlaying said end walls and being hingedly connected to said main portion along a pair of secondary side score lines which respectively overlay said pair of primary end score lines,

(6) an attachment section defined in the main portion of said divider panel by said pair of secondary end score lines and a fold line, said attachment section being adhered to said bottom panel,

(7) a partition section in the main portion of said first divider panel hingedly connected to said attachment section along said fold line, and

(8) substantially triangular web sections and end glue sections defined in the end portions of said first divider panel by a pair of biased fold lines, said end glue sections being adhered to said end walls.

4,177,716

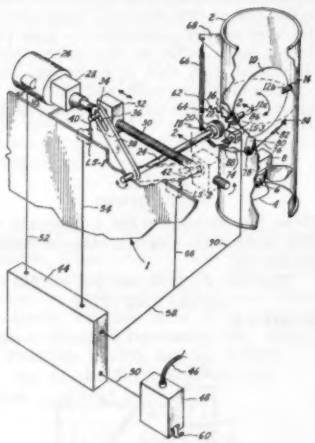
AUTOMATIC ENERGY SAVER AND FIRE DAMPER FOR EXHAUST SYSTEMS

Gerald J. Bowe, 3348 Morgan Ave., Eau Claire, Wis. 54701, and Thadeus Skuba, Osseo, Wis., assignors to Gerald J. Bowe, Eau Claire, Wis.

Filed Feb. 21, 1978, Ser. No. 879,735

Int. Cl.[2] F23J *11/00*

U.S. Cl. 98—115 SB **10 Claims**



1. Exhaust apparatus for a spray booth comprising:

an exhaust duct adapted to receive and discharge exhaust air from a spray booth;

a damper mounted in said exhaust duct for movement between open and closed positions therein;

a reversible motor for imparting movement to said damper in opposite directions between said open and closed positions;

power transmitting means drivingly connected between said motor and said damper;

a first limit switch operative in response to the movement of said damper to said closed position to stop said motor;

a second limit switch operative in response to the movement of said damper to said open position to stop said motor; and

switch means connected to said motor and movable to a first position in response to the termination of spraying opera-

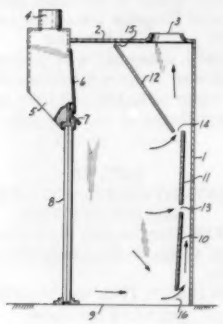
tion to actuate said motor for movement in one direction to close said damper and movable to a second position in response to the commencement of spraying operation to actuate said motor for movement in the opposite direction to open said damper.

4,177,717

BAFFLE SYSTEM FOR FUME HOOD

Harry N. Grow, Two Rivers, and Jon A. Zboralski, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 27, 1978, Ser. No. 928,462
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **20 Claims**



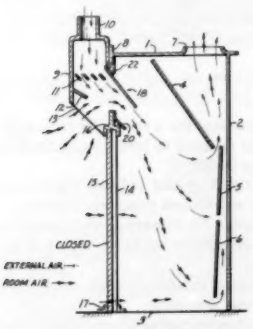
1. A fume hood including a housing that has a wall with an adjacent baffle system for directing fumes to an exhaust wherein the improvement comprises: at least three baffles which include a lower baffle, an intermediate baffle, and an upper baffle spaced from each other for gas flow through openings between the three panels; and the lower baffle has a bottom edge spaced from the wall to provide a bottom gas inlet to the three baffle system.

4,177,718

FUME HOOD

Harry N. Grow, Two Rivers, and Jon A. Zboralski, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 27, 1978, Ser. No. 928,463
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **14 Claims**



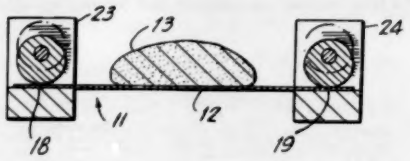
1. A fume hood with an inlet for external air and an openable sash for operator access to an interior of the hood, wherein the improvement comprises: an air supply actuated valve means in flow communication with the hood for directing an air supply through a sash opening in the hood when the sash is open, and for directing an air supply around the sash into the hood when the sash is closed.

4,177,719

COOKING PROCESS AND APPARATUS

Rodolfo R. Balaguer, 2607 Grace Dr., Harbor Beach, Fort Lauderdale, Fla. 33316

Continuation-in-part of Ser. No. 536,105, Dec. 24, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,055
Int. Cl.[2] H05B *7/06*
U.S. Cl. 99—358 **6 Claims**



1. A food cooking apparatus which comprises:
(a) a frame;
(b) an electrically conductive sheet having thickness in the range of 0.0005 to 0.125 inches;
(c) two parallel elongated electrically conductive clamps mounted on said frame for clamping respective opposite ends of said sheet to support said sheet between said clamps and make electrical contact to the ends of said sheet, each clamp comprising a first member having a horizontally disposed longitudinal upper surface and a longitudinal substantially cylindrical second member rotatably mounted above and substantially parallel to the upper surface of said first member by means of bearings adjacent each end of said second member, said second member being resiliently bowed between said bearings and being rotatable between a first position in which the substantially cylindrical side surface of said second member is bowed upward away from and does not contact the upper surface of said first member and an end of said sheet can be inserted or removed from between the upper surface of said first member and said second member, and a second position in which the end of the sheet is clamped between and in direct contact with the upper surface of said first member and the cylindrical side surface of said second member and the bow in the second member is at least partially straightened out against the clamped end of the sheet and the upper surface of the first member therebelow to apply substantially uniform pressure to the sheet along the length of the clamp; and
(d) electric current supply means mounted on said frame and electrically connected to said clamps for supplying current to said clamps so that the current flows through the sheet from one clamp to the other in an amount sufficient to cook a food article disposed on said sheet between said clamps.

4,177,720

PORTABLE GRILLING DEVICE

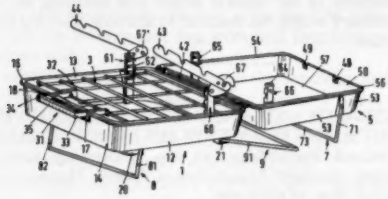
Klaus Schmidt, Ritterhude, Fed. Rep. of Germany, assignor to EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft, Bremen, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,153
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1978, 2800857
Int. Cl.[2] A47J *37/04, 37/07*
U.S. Cl. 99—419 **9 Claims**

1. A portable grill device comprising
first and second bowls hingedly connected to move between

an overlying closure position, a generally right angular use position, and a generally horizontal use position,

latch means partially carried by said first bowl and partially carried by said second bowl for releasably maintaining said first and second bowls in said right angular use position and for allowing said first and second bowls to open into said generally horizontal use position, said latch means being positioned adjacent the hinge edge of each of said first and second bowls,



at least one spit holder arm connected with said latch means, said spit holder arm and said latch means cooperating to locate said spit holder arm at an elevated position above said first bowl where said arm is directed toward that first bowl edge opposite to that first bowl's hinge edge, said cooperation being effected when said first and second bowls are in said right angular use position, and

a spit located in supportive relation with said spit holder arm.

4,177,721

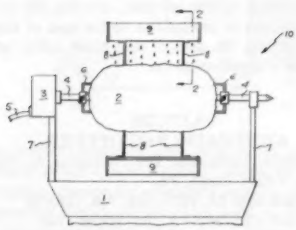
BARBECUE ROTISSERIE BASTER

Walden K. Redhead, 3831 E. McGilvra St., Seattle, Wash. 98112

Filed Feb. 1, 1978, Ser. No. 874,322

Int. Cl.[2] A47J *37/04*

U.S. Cl. 99—345 **5 Claims**



1. A barbecue rotisserie baster comprising in combination: a basting cartridge tube filled with basting sauce provided with control means for dispensing the sauce defined by a plurality of holes disposed substantially linearly longitudinally on said tube, leg elements having hooked end portions remote from said cartridge tube adapted to be inserted in an object to be basted, and means to fasten said leg elements to said cartridge tube comprising a loop section of suitable dimension to overlie said cartridge tube when said cartridge tube is slidably disposed therein and is provided with a screw means to constrain the cartridge within this loop, said loop is fastened to said leg elements.

4,177,722

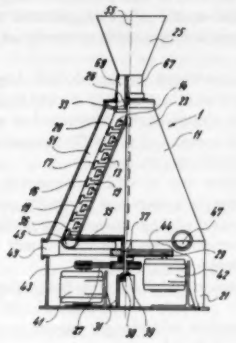
APPARATUS FOR THE CONTINUOUS SEPARATION OF THE FLESH OF FRUIT FROM THE PITS AND SKINS, ESPECIALLY OF THE PULP OF GRAPES FROM THEIR SEEDS AND SKINS

George C. van Olphen, Tucson, Ariz., assignor to Westfalia Separator Aktiengesellschaft, Oelde Westfalen, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,211

Int. Cl.[2] A23N *4/10, 7/00*

U.S. Cl. 99—540 **14 Claims**



1. In apparatus suitable for continuous separation of the flesh of fruit from its pits and skin comprising a rotor, a screen concentrically disposed opposite the rotor, the rotor having radial arms provided with hammer heads for working of the fruit for passage of the flesh through the screen and collection of the pits and skins on the screen, the improvement which comprises, the screen being rotatably mounted, drive means for the rotor and the screen for driving the rotor and screen at circumferential speeds differing by at least 10%, the hammer heads having striking surfaces inclined so as to form an acute angle with the axis of rotation in the radial projection of the striking surfaces onto the axis, and the rotor and screen being conical and disposed in nested relation.

4,177,723

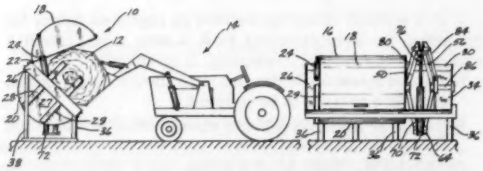
COMPACTOR DEVICE FOR LARGE ROUND BALES

Wesley F. Buchele, Ames; Dennis L. Jeffries, Waterloo; Ricky D. Madson, Ames; Timothy J. Mattson, Waterloo; Gregory E. Sparks, Waterloo; Raymond D. Thompson, Waterloo, and Howard T. Uehle, Waterloo, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 8, 1978, Ser. No. 876,055

Int. Cl.[2] B65B *13/20;* B30B *9/30*

U.S. Cl. 100—8 **4 Claims**



1. A compactor device for large round bales, comprising,

a bale compartment having first and second opposite ends and being adapted to receive a bale to be compacted, said first end being fixed to resist movement of the bale during compaction,

a plunger means slidably mounted within said bale compartment for movement towards and away from said first end,

said plunger means having a periphery adapted to substantially conform to the shape of said compartment,

a frame means secured to said second end of said bale compartment,

a double toggle means having two pairs of arms pivotally secured together and being adapted for expansion and contraction in a direction towards and away from, respectively, said first end of said bale compartment, said double toggle means having first and second opposite sides with said first side fixedly secured to said frame means and said second side secured to said plunger means for movement therewith, said second side being secured to said plunger means at a position generally centrally of the periphery thereof,

power means connected to said double toggle means for expanding and contracting said double toggle means,

a first stabilizer arm pivotally connected at one end to said double toggle means and pivotally connected at the other end to said frame means, and

a second stabilizer arm pivotally connected at one end to said double toggle means and pivotally connected at the other end to said plunger means at a position spaced between said periphery and the securement to said second side of the double toggle means,

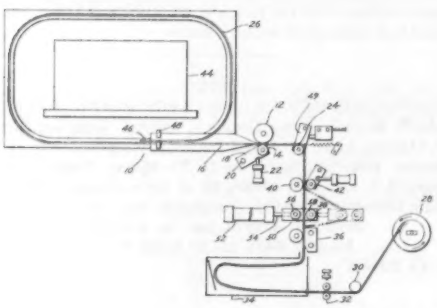
said first and second stabilizer arms being disposed in parallel relation to one pair of said arms of said double toggle means to maintain said plunger means in a constant attitude while said double means is being expanded to compact a bale within said bale compartment.

4,177,724

STRAP TENSIONING DEVICE

Eric A. Johnson, III, Crawfordsville; Melvin E. Moore, Rockville, and Tom A. Budd, Crawfordsville, all of Ind., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jun. 5, 1978, Ser. No. 912,512
Int. Cl.[2] B65B *13/22*
U.S. Cl. 100—26 **4 Claims**



1. In a package strapping machine an improved means for tightening the strap extending from a strap supply about a package to be strapped, comprising, in combination:

feed roller means for feeding the strap about a closed loop to encircle a package to be strapped,

means for gripping the lead end of the strap after it has been fed around the closed loop,

retract roller means for retracting excess strap from the closed loop after the gripping means has gripped the lead strap end so as to tighten the strap about the package,

a linearly reciprocating tension means positioned outside of the path of the strap between said feed means and said retract means and relatively farther from said closed loop than either the feed means or the retract means in relation to the direction of strap feed, said tension means positioned to extend in a direction approximately normal to the free running strand of strap passing through the tension means; and

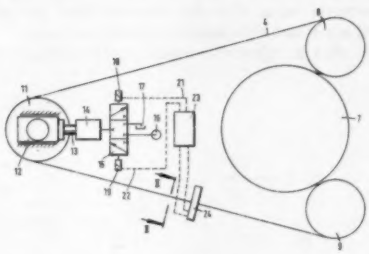
a secondary gripper means between the linearly reciprocating tension means and the strap supply adapted to grip the strap prior to operation of the linearly reciprocating tension means whereby, when the linearly reciprocating tension means extends to place a final tension in the strap about the package, the amount of strap take-up by the tension means is substantially greater than the linear extension of the tension means thus minimizing the required extension of the tension means and reducing the room necessary within the machine to accommodate the tension means.

4,177,725

METHOD OF AND APPARATUS FOR RECTIFYING DISTORTION IN AN ENDLESS PRESSING BAND

Rolf Gersbeck, Ronnenberg, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,493
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744919
Int. Cl.[2] B29C *3/00*; B29H *5/00*; B30B *15/28, 15/14*
U.S. Cl. 100—38 **2 Claims**



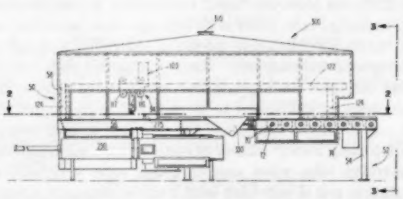
1. A method of rectifying distortion in an endless pressing band, which said pressing comprises a layer of rubber with a steel-wire fabric connected thereto, wound around a heating drum, two associated guide rollers and a hitch roller, comprising the steps of monitoring the relative positions of the opposite ends of one weft wire of said steel-wire fabric and, in the event of a deviation out of position of the two ends of that said weft wire in relation to one another, moving the axis of said hitch roller to adjust its inclination to the axis of said heating drum while retaining the axes of said hitch roller and of said heating drum in a common plane.

4,177,726

AUTOMATIC BAG OPENER

Gerald W. Kinard, Hillsboro, Tex., assignor to Certain-teed Corporation, Valley Forge, Pa.

Filed Jan. 12, 1977, Ser. No. 758,769
Int. Cl.[2] B65G *65/04*; B30B *1/00*
U.S. Cl. 100—214 **7 Claims**



1. An apparatus for automatically opening a bag comprising:

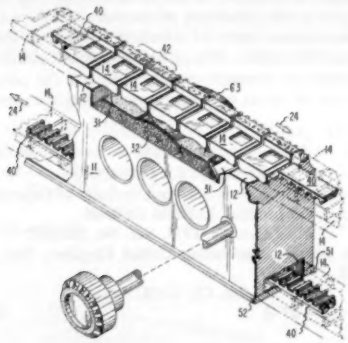
(a) a frame,
(b) a conveyor for transporting the bag into the apparatus,
(c) means operably associated with the conveyor for automatically removing the bag from said conveyor and for supporting and maintaining stationary said bag when said bag has reached a predetermined position on said conveyor, wherein said removing and supporting means comprises a first table operably associated with said conveyor for removing, supporting and maintaining stationary bags from said conveyor, and a second table positioned adjacent and rectilinearly aligned with the first table, and means for moving said bag from said first table to said second table,
(d) means operably associated with the removing and supporting means for cutting the bag, wherein said cutting means comprises at least one cutting wheel pivotally mounted to the apparatus and adapted to contact said bag when said bag is on said second table, and
(e) means operably associated with both said removing and supporting means and the cutting means for automatically gripping and moving said bag into and through said cutting means and automatically releasing said bag after said bag has moved through said cutting means.

4,177,727

LINE PRINTER CHARACTER CHAIN LUBRICATING DEVICE

Theodore M. Cooke, Altamonte Springs, Fla.; Lawrence T. Carian, Clawson, and Gunther R. Goetzinger, Detroit, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,290
Int. Cl.[2] F16N *7/12;* B41J *1/20*
U.S. Cl. 101—93.14 **4 Claims**



1. In a line printer character chain mechanism having a hard, support surface about which a printer character chain is rotated, a lubricating device for providing an accurate amount of lubricant between the character chain and the hard support surface, the lubricating device being located in a depression in the hard support surface and comprising a piece of flexible, microporous, polymeric material that is impregnated with a liquid lubricant nonreactive to the polymeric material has at least one depression formed therein that serves as a charging reservoir for the liquid and has a smooth convex arcuate surface for contacting the character chain, and means for semipermanently mounting the polymeric material in the depression in the support surface to provide at least a portion of the polymeric material in contact with the character chain as it passes thereby in rotation such that the polymeric material will maintain a desired amount of lubricant between the support surface and the side of the character chain normally in contact therewith.

4,177,728

METHOD FOR PRODUCING DUPLICATING STENCILS

Peter Koreska, Vienna, Austria, assignor to W. Koreska GmbH, Vienna, Austria

Filed Apr. 18, 1975, Ser. No. 569,360
Claims priority, application Austria, Apr. 26, 1974, 3462/74
Int. Cl.[2] B41N *1/24;* B41C *1/14*
U.S. Cl. 101—128.2 **4 Claims**

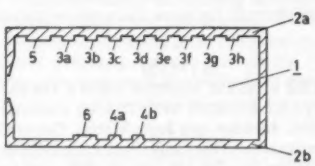
1. A method for producing a reusable, marked duplicating stencil of an original of an image having light and dark portions, comprising the steps of:
preparing a structure including an ink-permeable sheet composed of a plastic material having two major surfaces, and a first layer including a binding material and disposed on at least a portion of one of said major surfaces, said binding material including particles of a semiconductor,
establishing an electrostatic charge distribution on said first layer in correspondence to said image;
applying a toner to the electrostatically charged portions of said first layer;
subsequently, applying a second layer consisting essentially of a hot-seal adhesive to at least a portion of said first layer;
applying a third layer consisting essentially of a material substantially transparent to infra-red light to said second layer;
thereafter, subjecting said second layer to sufficient infra-red light to heat up the parts of said second layer corresponding to the dark portions of said image so that the heated parts, upon cooling, become adhered to said first layer; and
thereafter removing said second and third layers to obtain said stencil.

4,177,729

METHOD FOR THE PRODUCTION MARKING OF LIQUID DISPLAYS

Erwin Büchel, Ennetbaden; Ruurd de Fluiter, Zurich; Peter J. Wild, Wettingen, and Jörg Wullschleger, Mulligen, all of Switzerland, assignors to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 31, 1977, Ser. No. 829,482
Claims priority, application Switzerland, Nov. 24, 1976, 14746/76
Int. Cl.[2] B41F *15/34*
U.S. Cl. 101—129 **24 Claims**

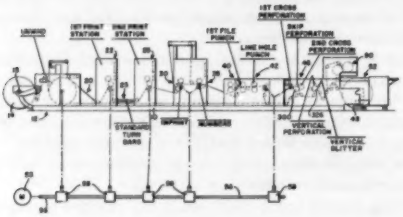


1. A method for the production marking of a liquid crystal display having a closure bar, said closure bar surrounding the area in which the liquid crystal is to be displayed and sealing said liquid crystal in said display, comprising:
providing a printing screen whose geometry includes said closure bar, wherein at least one sequence of projections which form a code projects from said closure bar; and
print forming said closure bar by use of said screen wherein the geometry of each of said sequence of projections simultaneously forms a portion of the geometry of said closure bar thereby coding said closure bar.

4,177,730
METHOD AND APPARATUS FOR WEB PRINTING

Louis Schriber; Robert E. Stephens, and John F. Blaha, all of Dayton, Ohio, assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 4, 1976, Ser. No. 738,751
Int. Cl.[2] B41F 5/08, 13/14, 29/00
U.S. Cl. 101—248 9 Claims



1. A method of makeready for a press having an unwind apparatus for supporting a rolled web of material and a plurality of rotatable members in spaced alignment defining a path for the web and arranged to perform operations on said web such as printing, perforating, numbering, punching or slitting, said members being rotatable in synchronism and being adjustable laterally and/or circumferentially with respect to the web path;

comprising the steps of

establishing a reference position in the unwind apparatus for the rolled web,

establishing separate side reference positions for each of said rotatable members having a lateral adjustment with respect to the unwind reference position, establishing a circumferential reference position for each of said rotatable members with respect to each other,

providing side measuring and circumferential measuring scale devices associated with each of the adjustable rotatable members to indicate lateral displacement and rotary displacement of the corresponding rotatable member from the reference positions,

establishing a coordinate layout system having reference marks corresponding to the reference positions and having scales in dimensions corresponding to said scale devices,

preparing a chart of dimensional settings using a representation of the desired product in conjunction with the layout system whereby measurements are provided for lateral and circumferential adjustment of the adjustable rotatable members using their respective scale devices, and the settings for the rotatable members can be accomplished with precision to minimize their adjustment once the web is threaded through the press and a run is started.

4,177,731
PRINTER SYSTEM RIBBON DRIVE HAVING CONSTANT RIBBON SPEED AND TENSION

Robert A. Kleist, Anaheim, and Jerry Matula, Culver City, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Continuation of Ser. No. 708,364, Jul. 26, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,290
Int. Cl.[2] B41J 33/14
U.S. Cl. 101—336 18 Claims

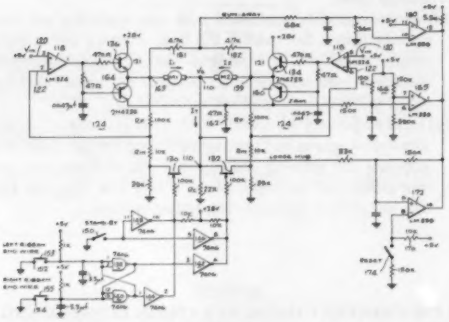
1. A system for driving an elongated web member comprising the combination of:

a pair of rotatable reel members;

an elongated web member extending between and having the opposite ends thereof wound on opposite ones of the pair of rotatable reel members;

a pair of direct current permanent magnet motors, each coupled to a different one of the pair of rotatable reel members; and

circuit means coupled to the pair of motors, the circuit means being operative to energize the motors so as to maintain a substantially constant tension on the web member and including common junction means coupled to each of the pair of motors, means coupled to one of the pair of motors operating as a web member takeup motor for providing a current therethrough and a resulting voltage drop thereacross, means responsive to the voltage drop across said one of the pair of motors for providing a current through the other one of the pair of motors operating as a web member supply motor and into the common junction means and being of sufficient value to maintain the voltage drop across said one of the pair of motors

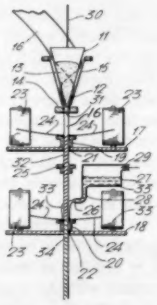


substantially constant, the other one of the pair of motors being operated in response to the voltage drop across said one of the pair of motors, a common current path coupled to each of the pair of motors via the common junction means, a first source of constant voltage coupled to said one of the pair of motors, a second source of constant voltage, differential amplifier means having an output coupled to the other one of the pair of motors and a pair of inputs, one input of which is coupled to the second source of constant voltage, and a feedback circuit coupled between the common current path and the other one of the pair of inputs of the differential amplifier means.

4,177,732
EXPLOSIVE FUSE-CORD

Daniel Steele, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 17, 1977, Ser. No. 843,057
Claims priority, application United Kingdom, Nov. 8, 1976, 46361/76
Int. Cl.[2] C06C 5/04
U.S. Cl. 102—27 R 21 Claims



1. An explosive fusecord comprising a core of explosive material surrounded by at least two layers of textile wrapping

material, two adjacent wrapping layers being bonded together by an intermediate layer of waterproof hot-melt adhesive material which is a blend of thermoplastic polymeric film-forming material and a tackifying resin.

4,177,733

SPIN STABILIZED PROJECTILE ASSEMBLY

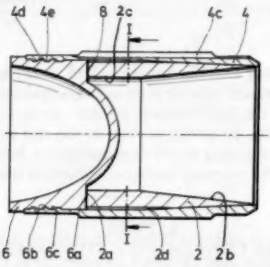
Rudolf Romer, Kaarst; Manfred Moll, Dusseldorf, and Christian Jaeneke, Aachen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Dusseldorf, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,496

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642222

Int. Cl.[2] F42B *13/02*

U.S. Cl. 102—93 **7 Claims**



1. A spin stabilized projectile assembly, comprising an annular projectile, a sabot, the projectile having a shoulder at the rear end which bears against the sabot, a barrel guide ring connecting the projectile and the sabot, said sabot having a diameter substantially equal to that of the projectile, the barrel guide ring extending around and over the projectile and a cylindrical part of the sabot, the guide ring being secured to the sabot against relative movement therebetween in a longitudinal direction but being rotatable with respect to the sabot.

4,177,734

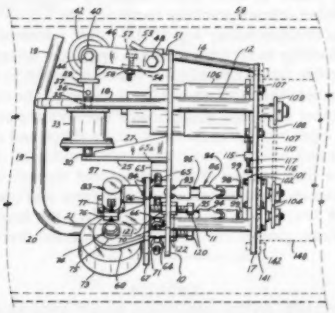
DRIVE UNIT FOR INTERNAL PIPE LINE EQUIPMENT

Gary S. Rhoden, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Oct. 3, 1977, Ser. No. 838,860

Int. Cl.[2] B61B *13/10*

U.S. Cl. 104—138 G **15 Claims**



1. Drive unit for propelling internal pipeline equipment through pipelines, comprising at least one wheel means disposed to roll along the length of the interior wall of a pipe into which said drive unit is inserted, each said wheel means being rotatable about a wheel axis transverse to the pipe axis, support means supporting each said wheel means within said pipe and adapted for movement lengthwise of said pipe, rotative drive motor means having an axial length longer than can be accommodated transversely within said pipe with said drive motor means disposed parallel to each said wheel axis to drive said wheel means, said rotative drive motor means being supported by said support means with its axis disposed parallel to said pipe axis and perpendicular to each said wheel axis to be accommodated within said pipe, and drive transmission means associated with each said wheel means adapted to transmit rotational energy from said drive motor means to said wheel means perpendicularly disposed thereto to drive said wheel means; said drive motor means having a chain sprocket carried on an axial drive shaft thereof, each said wheel means having a chain sprocket parallel thereto and rotatable therewith, each said drive transmission means having a first chain sprocket aligned with said drive motor means chain sprocket and having a second chain sprocket aligned with the associated wheel means chain sprocket, a first drive chain engaged around said drive motor chain sprocket and each said first chain sprockets, and a second drive chain engaged around said second chain sprocket of each said drive transmission means and the associated wheel means chain sprocket, each said wheel means being mounted on a wheel support plate pivotably supported by said support means for movement about an axis radial with respect to a pipe in which said drive unit is disposed, and adjustment means carried by said support means for adjustably fixing the rotational position of each wheel support plate with relation to the radial axis whereby the camber of each wheel means may be adjusted.

3. Drive unit for propelling internal pipeline equipment through pipelines, comprising at least one wheel means disposed to roll along the length of the interior wall of a pipe into which said drive unit is inserted, each said wheel means being rotatable about a wheel axis transverse to the pipe axis, support means supporting each said wheel means within said pipe and adapted for movement lengthwise of said pipe, rotative drive motor means having an axial length longer than can be accommodated transversely within said pipe with said drive motor means disposed parallel to each said wheel axis to drive said wheel means, said rotative drive motor means being supported by said support means angularly to each said wheel axis to be accommodated within said pipe, and drive transmission means associated with each said wheel means adapted to transmit rotational energy from said drive motor means to said wheel means angularly disposed thereto to drive said wheel means, support means comprising spaced first and second parallel plates each disposed transversely of the axis of a pipe within which the drive unit is disposed, means interconnecting said first and second plates, said first plate being adapted for connection to internal pipeline equipment to be propelled through the pipe, said drive motor means being supported by said first plate and extending through an opening through said second plate, said wheel means being supported by said second plate, said drive transmission means each being supported by said first plate and extending through an opening through said second plate to be connected to a said wheel means.

4,177,735

CAR IMPACT CUSHIONING AND COUPLER CENTERING ARRANGEMENT FOR RAILROAD TRACK BUMPING POSTS

Carl N. Rydin, 4S556 River Rd., Naperville, Ill. 60540

Filed May 1, 1978, Ser. No. 901,497

Int. Cl.[2] B61K *7/18*

U.S. Cl. 104—254 **11 Claims**

1. A shock absorbing attachment for railroad track bumping posts of the type including a vertically disposed striking plate fixedly mounted above the track at the level of the car center line of draft adjacent the end of the track right of way for engagement by the car coupler, said attachment comprising:

a bearing plate having a forward side and a rearward side,

means for mounting said bearing plate on the striking plate with the bearing plate forward side facing the track right

of way and with said bearing plate extending crosswise of the track and being vertically disposed,

said bearing plate forward side defining a seat,

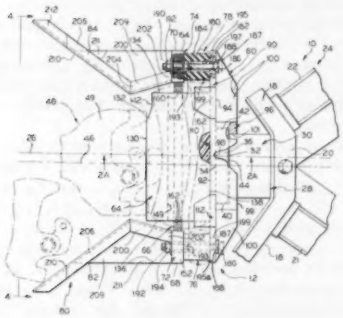
a body formed from resiliently compressible material and being of generally parallelepiped configuration defining a rear side seated on said bearing plate seat and a front side facing oppositely of said rear side,

said body being formed to define a cross bore therethrough that parallels said front and rear sides of said body,

a leaf spring positioned in said body bore and proportioned lengthwise thereto to have its ends extend externally of said body bore on either side of said body,

said leaf spring having a rectangular transverse cross-sectional configuration and being disposed to have the long sides of its said configuration in substantial parallelism with said bearing plate and proportioned such that said leaf spring engages the upper and lower portions of said body bore,

said leaf spring ends each having interposed between same and said bearing plate a compression spring assembly,



said compression spring assemblies each comprising:

a center rod anchored between the respective leaf spring ends and said bearing plate and an annular compression spring through which the respective center rods extend,

said center rods being disposed in substantial parallelism and projecting forwardly of said bearing plate bearing seat on either side of same,

said center rods being connected to said bearing plate for swinging movement of their forward ends toward each other under the impact of a car coupler against the front side of said body to compress said body against said bearing seat with said leaf spring adjacent the mid length of same being deflected toward said bearing plate under such impact,

whereby said body and said leaf spring act in combination to cushion said impact with said center rod forward portions swinging toward each other to compress said compression spring assemblies for supplementing the resistance of said body and said leaf spring to said impact.

4,177,736

MECHANICALLY AND WELDINGLY SECURED BRACKET

Phillip G. Przybylinski, Schererville; Babgaunda A. Patil, Hammond, both of Ind., and George S. McNally, South Holland, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Nov. 28, 1977, Ser. No. 855,518

Int. Cl.[2] B61D *17/16, 39/00;* **E04B** *7/16;* **E04D** *13/14*

U.S. Cl. 105—377 **7 Claims**

1. In a railway hopper car having sides, ends and a roof including coaming defining a hatch opening;

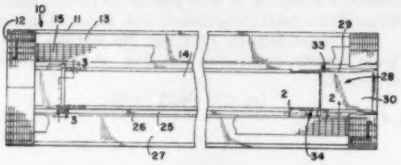
said coaming having a pair of longitudinally extending side walls and a pair of transversely extending end walls intersecting to define corners;

end closure sections abutting each of the transversely extending end walls, the improvement comprising:

a reinforcing member at each corner connecting the coaming to the end closure section;

said reinforcing member including inner, intermediate and outer end portions; and

said reinforcing member having mechanical securement means attaching the inner end portion to the coaming; and



said reinforcing member having a rigid securement comprising weld means spaced from said mechanical securement attaching the intermediate portion to the coaming and attaching the outer end portion to the end closure section thereby mitigating stress concentrations leading to fracturing of the coaming during operation of the railway car.

4,177,737

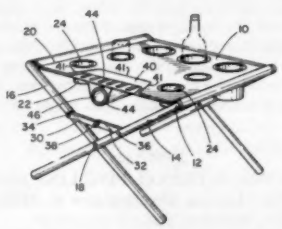
FOLDABLE CONVERTIBLE STOOL-TABLE-BAR

Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625

Filed Jul. 14, 1977, Ser. No. 815,717

Int. Cl.[2] A47B *85/00*

U.S. Cl. 108—11 **6 Claims**



1. A foldable stool-table-bar comprising a pair of U-shaped members each of which is formed of a pair of laterally spaced apart legs joined at their upper edges by an elongated cross brace member, means pivotally mounting the leg of one member to the corresponding leg of the other intermediate their ends for rocking movement between open and collapsed position, a flexible fabric one edge of which is joined to one cross brace member while the other edge is joined to the other cross brace member to extend continuously between the cross brace members, openings in the fabric having a shape and dimension corresponding to cups, saucers, glasses, bottles or dishes, for enabling a base portion thereof to extend therethrough, and flexible pockets extending downwardly from said openings for a distance beyond the fabric but less than the length of the cups, saucers, glasses, bottles or dishes inserted therein.

4,177,738

FURNITURE WITH OPENING FLAP AND SUPPORT THEREFOR

Rejean Lacasse, 167 St. Francois St., Saint-Pie de Bagot, Canada (J0H 1W0)

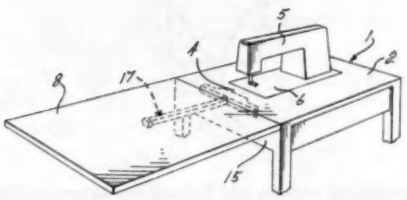
Filed Jan. 23, 1978, Ser. No. 871,206

Int. Cl.[2] A47B *1/04, 81/00*

U.S. Cl. 108—78 **1 Claim**

1. In a piece of furniture or the like, the combination comprising a furniture body including a top panel member and a

side wall having an aperture therethrough underneath and adjacent said top panel member, a flap having one edge pivoted to said top panel member to an open flat position outwardly extending edgewise from said top panel member and from said side wall, a flap supporting assembly consisting of a reinforcing bracket member secured against the bottom of said top panel member, said reinforcing bracket constituting an elongated member longitudinally extending lengthwise of said side wall and having a C-shaped transverse profile including a top portion secured against the bottom of said top panel member, a first side portion secured against the inner side of said side wall, and spaced from a second inwardly located side portion, a slideway member fixedly secured between said first and said second side portions, and defining a slideway passage which is non circular and which extends substantially parallel



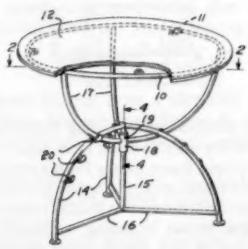
to said top panel member adjacent the bottom face of the latter and in register with said side wall aperture, and a supporting arm of non circular cross-section slidable endwise through said slideway member and said first and second side portions, said reinforcing bracket and said slideway member being located centrally of said side wall and said supporting arm is perpendicular to said side wall and includes an outer longer straight portion and an inner shorter straight portion bent at an obtuse angle relative to each other, whereby said longer straight portion is upwardly inclined when said arm is in extended position and said shorter straight portion engages said slideway passage, and said longer straight ortion engages said slideway passage and is substantially parallel to said top panel member when said arm is in retracted position, said shorter straight portion being then upwardly inclined.

4,177,739

VERTICALLY ADJUSTABLE TABLE

Richard D. Phelps, Lakeside, Conn., assignor to Back Bay Company, Inc., Wellesley Hills, Mass.

Filed Sep. 5, 1978, Ser. No. 939,273
Int. Cl.[2] A47B 9/00
U.S. Cl. 108—144 **9 Claims**



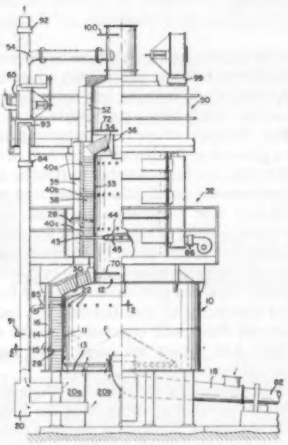
1. A table comprising an upper section including a top, depending and inwardly disposed supports connected thereto, and a central, vertical sleeve to which the inner ends of the supports are secured, and lower supporting section including legs, each extending upwardly and inwardly between two supports, a central pivot of substantial length extending downwardly through said sleeve, the inner ends of said legs secured to the upper end of said pivot, and means to enable at least two different table heights to be established, said means including leg-mounted, laterally exposed and vertically spaced support holders, each holder engageable by a support when the upper section is held in an appropriate vertical position relative thereto and turned into a position in which that support is seated thereon by gravity.

4,177,740

APPARATUS FOR GENERATING HEAT FROM WASTE FUEL

Frank H. Lamb; Malcolm D. Lefcort, both of Vancouver, and Petr Rada, North Vancouver, all of Canada, assignors to Enterprises International, Inc., Aberdeen, Wash.

Filed Mar. 10, 1978, Ser. No. 885,377
Int. Cl.[2] F23G 5/12
U.S. Cl. 110—213 **13 Claims**



1. A waste wood fuel burner comprising:

a primary combustion chamber having an outlet, an inlet and a side wall,

means at the inlet for supporting a pile of fuel,

means for feeding the pile,

means for guiding underfire air through said pile,

a secondary combustion chamber having an inlet, an outlet and a side wall,

means between the primary combustion chamber outlet and the secondary combustion chamber inlet for impeding movement of unburned particulate matter out of said primary combustion chamber but allowing free passage of volatile gases,

means introducing swirl air into said primary combustion chamber,

means for introducing secondary combustion air into said secondary combustion chambers, and

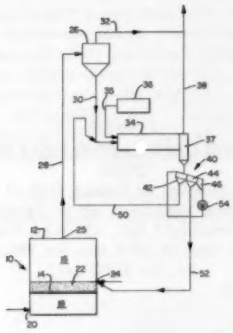
control means for limiting the swirl air to an amount when combined with said underfire air results in less than stoichiometric combustion in said primary combustion chamber, and for increasing secondary combustion air in said secondary combustion chamber for assuring more than stoichiometric combustion in said secondary combustion chamber.

4,177,741

SYSTEM AND METHOD FOR IMPROVING THE REACTION EFFICIENCY OF A FLUIDIZED BED

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 19, 1978, Ser. No. 916,997
Int. Cl.[2] F23D 1/00; F23B 7/00
U.S. Cl. 110—263 **6 Claims**



1. A system for improving the reaction efficiency of a fluidized bed combustor or reactor, comprising a housing, a perforated plate disposed in said housing and defining a chamber in said housing, means to introduce particulate material containing fuel into said chamber where it accumulates on said plate, means to pass a gas upwardly through a portion of the perforations in said plate and into said chamber to fluidize said particulate material, promote the combustion of said fuel material, and entrain the relative fine particulate material, outlet means formed in the upper portion of said housing for permitting said gas and entrained particulate material to discharge from said housing along with the gaseous products of combustion, means for separating said entrained particulate material from said gas, means disposed externally of said housing for receiving said particulate material from said separating means and for agglomerating same and means for passing the agglomerated particulate material back into said chamber.

4. A method for improving the reaction efficiency of a fluidized bed combustor or reactor, comprising the steps of passing a gas upwardly through a particulate material containing fuel disposed in a chamber to fluidize said particulate material, promote the combustion of said fuel material and entrain the relative fine particulate material, permitting said gas and entrained particulate material to discharge from said housing along with the gaseous products of combustion, separating said entrained particulate material from said gas, agglomerating said particulate material externally of said housing, and passing the agglomerated particulate material back into said chamber.

4,177,742

INCINERATOR FOR BURNING WASTE AND A METHOD OF UTILIZING SAME

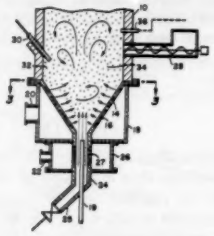
Toshio Uemura; Yoshiki Watanabe; Yoji Masumoto; Tomihisa Ishikawa; Noboru Kajimoto, all of Kure, and Shin Kawada, Tokyo, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,261
Int. Cl.[2] F23G 7/00
U.S. Cl. 110—346 **6 Claims**

1. A process for burning waste in an incinerator of the type including a hollow body having an open upper end forming an outlet and an open lower end, a bottom plate closing the lower end, a central opening provided in the bottom plate for introducing pressurized oxidizing gas into the hollow body, a plurality of circumferentially disposed openings provided in the bottom plate for introducing pressurized oxidizing gas into the hollow body, an oxidizing gas feeding means for supplying gas to the central opening and circumferentially disposed openings, heat transfer medium particles provided in the hollow body and a means for feeding waste into the hollow body comprising the steps of:

forming a swirling blast fluidized bed of heat transfer medium particles above said bottom plate by blowing oxidizing gas through said central and circumferentially disposed openings in upwardly vertical and horizontally circumferential directions;

introducing waste into said fluidized bed;



burning said waste in said fluidized bed at between 500° C. and 1000° C.;

retaining any resulting combustion gas from said burning in a free space above said fluidized bed for a sufficient period of time required for combustion of any unburned components contained in said combustion gas;

discharging said combustion gas from said outlet; and

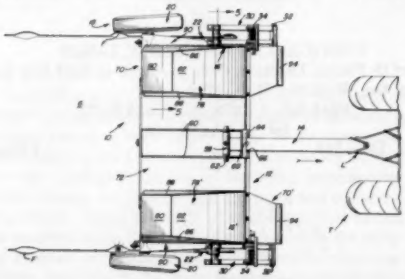
blowing cooling air into said outlet to maintain the temperature of the combustion gas discharged through said outlet in a range from 350° C. to 670° C.

4,177,743

SEEDLING TRANSPLANTER

Herschel L. Webster, Rte. 1, Cleveland, Ga. 30528

Filed Mar. 20, 1978, Ser. No. 888,131
Int. Cl.[2] A01C 11/02
U.S. Cl. 111—3 **12 Claims**



1. A seedling transplanter including frame means, ground-engageable wheel means journaled from said frame means for rolling support of said frame means from a ground surface and movement of said frame means over the ground surface along a first path in a predetermined orientation relative to said frame means, said wheel means including a plurality of journaled wheels, at least one of said wheels being angularly positioned relative to said path, a substantially planar coulter disk journaled from said frame for rotation about an axis disposed at substantially right angles relative to said path and positioned ahead of said one wheel in the direction of intended movement of said frame means along said path, said coulter disk being disposed at an elevation to knife through the upper layer of said ground along a second path paralleling the first path and spaced slightly to the side of the track of said one wheel

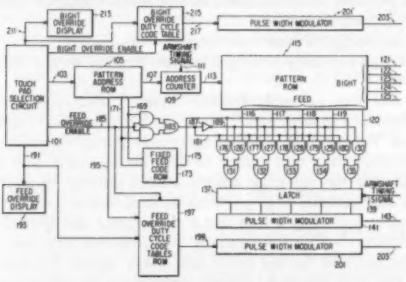
toward which the rear portion of said one wheel is angled, said coulter disk including a generally radially extending wave therein defined by successive reversely curving peripheral portions of said disk, said wave projecting outwardly from the plane of the remainder of the disk toward the side of said second path on which said one wheel is disposed.

4,177,744

DIGITAL OVERRIDE CONTROL OF BIGHT AND FEED IN A SEWING MACHINE

John W. Wurst, Dover, and William H. Dunn, Branchville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,940
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, static memory means for storing pattern stitch information, means operating in timed relation with said sewing machine for recovering selected pattern stitch information from said static memory means, separate actuating means responsive to said pattern stitch information for influencing the feed and bight motions respectively to produce a pattern of stitches corresponding to the selected pattern stitch information, and controllable alteration means effective to alter the operation of at least one of said feed and bight actuating means to an amount of motion proportional to that dictated by said pattern stitch information, the improvement comprising:

override memory means for storing actuating means motion alteration values in addressable memory locations;

operator controlled means for providing an address signal corresponding to a desired alteration value;

means utilizing said address signal for retrieving from said override memory means said desired alteration value; and

converting means for converting said desired alteration value into a control signal for rendering effective said alteration means to proportionally alter the size of the selected pattern produced by said sewing machine.

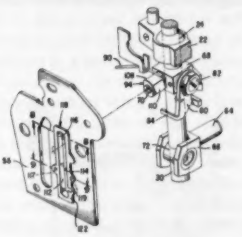
4,177,745

NEEDLE BAR GUIDE FOR A SEWING MACHINE

Kenneth D. Adams, Madison, and Robert B. Brauch, Wayne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jun. 7, 1978, Ser. No. 913,424
Int. Cl.[2] D05B *69/02*
U.S. Cl. 112—221 **4 Claims**

1. In a skip-stitch type sewing machine, the combination including a needle bar, a latch carrier secured to the needle bar, cranking means attachable to and detachable from the latch carrier for reciprocating the carrier and needle bar when connected thereto, a plastic toe affixed to the latch carrier, and a fixed head end mounting plate including a molded plastic guide with an elongated slot having opposite planar sides, said plastic guide including marginal flanges extending therearound which contact opposite sides of the plate and prevent movement of the guide in a direction perpendicular to the plate, the toe having opposite flat sides which engage the opposite planar sides of the slot to angularly orient the latch carrier and to define the path of the latch carrier during reciprocation of the



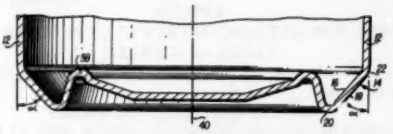
latch carrier by the cranking means, the toe and guide being of dissimilar compositions and the molded plastic guide being of a softer material than the toe.

4,177,746

METHOD OF FORMING A CONTAINER

Harry W. Lee, Jr.; Joseph W. Wallace, and James M. Woolard, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 774,475, Mar. 4, 1978, which is a continuation-in-part of Ser. No. 709,903, Jul. 29, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,261
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—120 H **6 Claims**



1. In a method of making a container having a cylindrical side wall and a bottom-closing portion closing one end thereof, the improvement comprising forming a frustoconical portion having one thereof directly attached to said side wall, forming a first semi-torroidal portion having one end thereof directly attached to the other end of said frustoconical portion, forming a second semi-torroidal portion having one end thereof directly attached to the other end of said first semi-torroidal portion and directly attaching the other end of said second semi-torroidal portion to said bottom-closing portion.

4,177,747

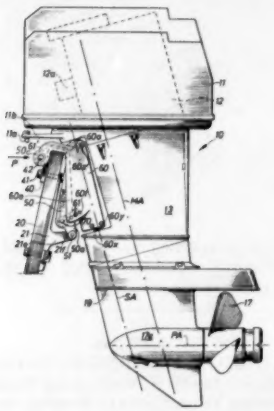
OUTBOARD MOTOR BRACKET ASSEMBLY

Heinz Pichl, Upsala, Sweden, assignor to Ab Volvo Penta, Gothenburg, Sweden

Filed Aug. 23, 1977, Ser. No. 827,005
Claims priority, application Sweden, Aug. 27, 1976, 7609500
Int. Cl.[2] B63H *21/26*
U.S. Cl. 115—41 HT **24 Claims**

1. A bracket assembly for trimmably and tiltably attaching a drive leg to the transom of a boat, a first part of the bracket assembly being attached to said transom and swingable about an essentially horizontal lateral axis and the drive leg itself being steerably attached to a second part of the bracket assembly, said second part being displaceable relative to said first part and co-operating therewith, characterized in that a device for the adjustment of the trim position of said drive leg is connected between said transom and said first part, said second part is pivotable about an essentially horizontal tilt pin and a second device for the adjustment of the trim position of the leg

is connected between said first and second parts, the axis of said tilt pin being coincident with said lateral axis, said second part is arranged for being tilted-up about said tilt pin relative to said first part up to the extreme tilt-up position of said drive leg and for returning into the operating trim position adjusted by



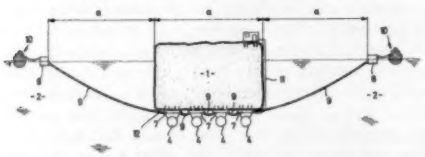
said second trimming device, said drive leg is attached to said second part for rotation about a steering axis but fixedly with respect to relative movement about said tilt pin, so that said drive leg takes part in all tilt movements of said second part about said essentially horizontal pivot axis.

4,177,748

DEVICE FOR ATTACHING PROPULSION UNITS TO A TABULAR ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Mar. 8, 1978, Ser. No. 884,405
Claims priority, application France, Mar. 8, 1977, 77 06704
Int. Cl.[2] B63H *23/32*
U.S. Cl. 115—76 **10 Claims**



1. A device for attaching underwater propulsion units to the substantially horizontal lower surface of a tabular iceberg, the device comprising a flat flotation unit incorporating buoyancy chambers, the lower portion of the flotation unit being adapted to be attached to a propulsion unit, and the upper portion of the flotation unit having a plurality of upstanding support members for embedding in the lower surface of the iceberg, the support members including heating means and being in the form of hollow right prisms with walls which are grooved to facilitate the escape of iceberg melt water during embedding and which have openings in the vicinity of their connection to the flotation unit to enable seawater to escape from the hollow interior of the support members during embedding.

10. The method of recovering a propulsion device attached to a lower surface of an iceberg comprising the steps of

(a) heating a support member attaching the propulsion device to said iceberg to partially melt the ice thereof and release the support member therefrom; and

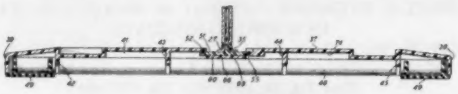
(b) filling a flotation unit of the device with water to exercise an Archimedean downthrust on said support member and carry said device away from said iceberg.

4,177,749

DEMOUNTABLE TWO-COMPONENT ROADWAY SIGNAL ASSEMBLY

Henry Lindner, Elgin, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed Dec. 15, 1978, Ser. No. 969,708
Int. Cl.[2] E01F *9/10*; G02B *5/12*
U.S. Cl. 116—63 T **11 Claims**



1. A portable wind-resistant, demountable collapsible signal assembly comprising

(A) an elongated base construction,

(B) a sign assembly having a bottom portion with a bottom side,

(C) said sign assembly further having a disc member disposed in a spaced, parallel relationship to said bottom side, and having disc connecting means mounting said disc member to a mid-region of said bottom side, said disc member having edge discontinuities defined in selected circumferential edge portions thereof, said edge discontinuities including a first slot and a second slot spaced circumferentially approximately 90° from said first slot, said disc member having upper and lower surface portions,

(D) said sign assembly further including a pair of flattened leg members which downwardly extend from said bottom side, and leg connecting means mounting said pair of leg members to said bottom side with each one of said leg members being generally in the region of a different opposed end region of said base portion,

(E) said base construction comprising

(1) a housing having a platform plate with integral, inturned side and end flanges which together with said platform plate define a chamber,

(2) ballast means disposed in said chamber, including ballast retaining means therefor,

(3) said platform plate having a depression defined in an upper mid portion thereof, with opposed recesses having overhanging lip portions along side edge portions of said depression the interrelationship between said recesses, said lip portions, and said depression being such that its disc member is positionable in said depression with circumferential edge portions thereof being in sliding retained engagement with said recesses and said lip portions and further being axially pivotable relative thereto,

(4) said platform plate further having boss means depending from the under surface of said platform plate in the region of said depression for locating and limiting lateral movements of said disc member relative to said platform plate when said disc member is so positioned in said depression,

(5) said platform plate still further having defined therein an elongated, resilient locking finger which is integral with said platform plate at a root end thereof, and which is separated from said platform plate along the opposed sides and at the forward end thereof, said resilient locking finger being adapted for flexural movements normally relative to said platform plate said root end being located in longitudinally spaced relationship to one side of said depression, and said forward end being located in an adjacent relationship to said depression,

(F) the interrelationship between said locking finger, said disc member, and the associated components as defined above is such that, when said disc member is so positioned in said depression,

(1) said disc member is pivotable in said depression when

said locking finger is depressed at least sufficiently to permit said forward end thereof to slidably engage the lower surface of said disc member,

(2) said disc member is locked against pivotal and other movements relative to said base construction when said bottom portion extends generally across said base construction, said forward end engages said first slot, and said locking finger is in a relaxed configuration,

(3) said disc member is yieldingly biased against pivotal and other movements relative to said base construction when said bottom portion extends generally parallelly along said base construction, said forward end engages said second slot and said locking finger is in a relaxed configuration, and

(G) the interrelationship between said locking finger, said disc member, said platform plate, and the associated components as defined above is such that

(1) when said disc member is so positioned in said depression, and said locking finger is raised at least sufficiently to permit said forward end thereof to slidably engage the upper surface of said disc member, said disc member is pivotable in said depression,

(2) said disc member is orientable relative to said platform plate by pivoting same in said depression with said locking finger so raised into a position where said boss means along one hemicircular circumferential region thereof are aligned with edge discontinuities in said disc member,

(3) when so positioned, said disc member is translatable laterally relative to said depression to an extent sufficient to permit said disc member to be tiltable relative to said base construction and removable from said recesses and said overhanging lip portions and said base construction, and

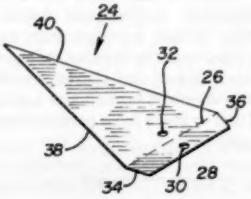
(4) said disc member, when separated from said base construction, is engagable therewith by so orienting said disc member relative to said platform plate with said locking finger so raised.

4,177,750

PENNANT AND METHOD OF MAKING A PENNANT

Ted Scarlet, 101 Lilac St., Bergenfield, N.J. 07621

Filed Sep. 14, 1977, Ser. No. 833,306
Int. Cl.[2] G09F *17/00*
U.S. Cl. 116—173 **4 Claims**



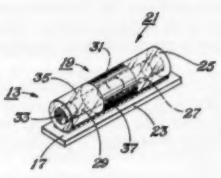
1. An improved pennant made of man-made fiber and having at least one side printed to depict scenes, names, insignias and combinations thereof and the like, the pennant being precision cut from a larger piece of fabric to provide the desired outer configuration, the pennant printed from a transfer member of paper and the like which is printed on one face with and by offset printing using and applying to one face of the transfer member a color sequence of special dye dispersal inks printed as a mirror reproduction of the to be depicted representation, said transfer member cut to provide at least one edge which is accurately positioned with relation to the depicted representation the pennant including (a) a pennant of material of man-made fiber sheet material, the sheet being die cut to provide a precise guide edge along at least one edge of the sheet of material and to provide two ends, one longer than the other; (b) a printed design applied to the face of the pennant, this design applied when and as the printed face of the transfer member is placed in a selected position adjacent to and on the face of the pennant material after which with an application of determined pressure and a heating of about sixteen seconds at one hundred eighty degrees centigrade a transfer design from the transfer paper to the pennant material is achieved; (c) an additional lip portion formed on the long end of the pennant, this lip portion foldable at a perforated line formed at selected distance from and parallel to the end of the pennant, the securing of the lip to form a tunnel being a single pass of a sewing machine; (d) a pair of small holes of like size formed before securing the lip in the pennant material, the holes laying on a common line normal to the perforated line with one on each side of the perforated line and at an equal distance therefrom so that when the lip is secured the holes are substantially in coincidence, and providing means for mounting and supporting the pennant on a pin, nail and the like, and (e) a tunnel formed by securing said lip in a fold-over condition to the pennant material after removal of the transfer paper from the face of the pennant, said tunnel providing a mounting of a stick, rod and the like, the ends of the material being cut so as to not protrude beyond the sides of the pennant after the fold-over and tunnel have been formed.

4,177,751

METHOD OF FORMING A DEVICE FOR SHOWING RECEIPT OF PREDETERMINED SHOCK

Ulyss R. Rubey, Lewisville, Tex., assignor to Detectors, Inc., Graham, Tex.

Division of Ser. No. 788,008, Apr. 15, 1977, Pat. No. 4,125,085.
This application Jun. 7, 1978, Ser. No. 913,479
Int. Cl.[2] G01P *15/04*
U.S. Cl. 116—201 **3 Claims**



1. A method of forming a shock detection device for detecting and notifying an observer that a predetermined acceleration has been received by an article being monitored comprising the steps of:

A. forming a measuring means for measuring if said predetermined acceleration has been received by constraining a liquid into the form of a deformable reservoir that will deform responsive to acceleration and return to its original shape when the acceleration ceases if the acceleration is below the predetermined acceleration; containing a gas adjacent said deformable reservoir of liquid and in contact with at least one side thereof so as to define an interfacial barrier therebetween having a predetermined interfacial tension, the size of the liquid reservoir and the interfacial tension being chosen such that said predetermined acceleration effects rupture of said interfacial barrier such that at least a droplet of said liquid breaks away from said liquid reservoir; sealingly containing said reservoir of liquid and said gas within a structure;

B. forming an indicator means and connecting said indicator means with said measuring means for indicating that said predetermined acceleration has been effected; said indicator means being formed by providing a visual means disposed adjacent said interfacial barrier for indicating when said interfacial barrier has been ruptured and

C. connecting said measuring means and said indicator means with an attachment means for attaching said device

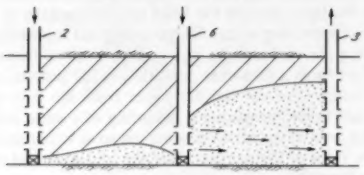
to the article for monitoring if said predetermined acceleration has been received.

4,177,752

HIGH VERTICAL CONFORMANCE STEAM DRIVE OIL RECOVERY METHOD

Alfred Brown, Houston, Tex.; Brian L. Reynolds, Cookeville, Tenn., and Wilbur L. Hall, Bellaire, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,438
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—263 **14 Claims**



1. A method of recovering viscous oil from a subterranean, viscous oil containing formation, said formation being penetrated by at least three wells, one injection well and one production well, both of said injection and production wells being in fluid communication with a substantial portion of the vertical thickness of the formation, and an infill well located within the recovery zone defined by the injection well and production well and in fluid communication with only the lower 50 percent or less of the formation, comprising:

(a) injecting a thermal oil recovery fluid comprising steam into the formation via the injection well and recovering fluid including oil from the formation by the production well until the fluid being recovered from the production well comprises a predetermined amount of steam or water;

(b) thereafter recovering fluids including oil from the formation by the infill well and continuing injecting said thermal oil recovery fluid into said injection well until the fluid being recovered comprises a predetermined fraction of steam or water;

(c) thereafter injecting hot water into the infill well and recovering fluids from the formation by means of the production well until the percentage of water in the fluids being recovered reaches a predetermined value; and thereafter

(d) injecting steam into the infill well;

(e) injecting an aqueous fluid into the injection well simultaneously with steps (c) and (d) at a rate sufficient to maintain a positive pressure gradient from the injection well to the infill well; and

(f) recovering fluids from the formation via the production well until the fluids being recovered comprise at least 80 percent water.

4,177,753

WETTING STATION, ROTATING CONVEYOR STATION, SELF CLEANING CONVEYOR UNIT, AND CONVEYOR SYSTEM USING SAME

Ronald D. Bourgeois, 38 Ellison Pk., Waltham, Mass. 02154

Filed Jul. 25, 1977, Ser. No. 818,318
Int. Cl.[2] A23G *3/20*; B05C *3/10, 19/00*
U.S. Cl. 118—16 **1 Claim**

1. A conveyor system comprising:

a wetting station including a container adapted for holding a wetting agent;

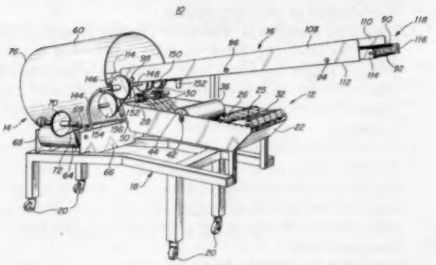
a slack conveyor belt having at least its transfer path portion extending through said container and at least a part of that portion dipping below the level of the wetting agent;

a ballast roller, at least partially submerged in the wetting agent and bearing on the part of the transfer path portion of the conveyor belt which dips into the wetting agent, for compelling conveyed objects to pass submerged in the wetting agent between the ballast roller and conveyor belt, said ballast roller being continuously vertically moveable relative to the transfer path portion of said conveyor belt for accommodating variations in the thickness of conveyed objects;

a rotating conveyor station including a hollow drum open at only one end for receiving objects conveyed from said wetting station;

means for rotating said drum about an inclined, longitudinal axis with its open end being the higher end;

a plurality of individual pick-up pins extending generally, radially inwardly from the inner surface of said drum for picking up items accumulated with the coating agent in the lower position in said drum and carrying them to the upper position in the drum for release onto a self-cleaning



conveyor unit including a support structure including a bottom member and two side members;

a plurality of roller means supported by said support structure; and

a perforate conveyor belt driven on said roller means and extending in its return path along said bottom member for a substantial portion of the length of said bottom member for sweeping particles dropped from the transported objects and accumulating on said bottom member back in the direction from the terminus toward the origin of the conveyor belt for return to said drum; said side members extending substantially beyond said bottom member toward the origin of said conveyor belt; said support structure being tilted with the terminus set higher than the origin of the conveyor belt; and a shaker member extending from said side members beyond said bottom member for jarring said belt to shake loose particles from said belt and conveyed objects.

4,177,754

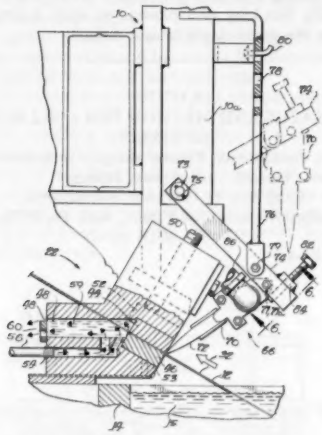
APPARATUS FOR OBTAINING BRIGHT FINISH GALVANIZING COATING ON WIRE

William L. James, and Alex P. Wonso, both of Homewood, Ill., assignors to Fennell Corporation, Harvey, Ill.

Filed May 30, 1978, Ser. No. 910,185
Int. Cl.[2] C23C *1/02*
U.S. Cl. 118—47 **5 Claims**

1. Apparatus for obtaining a bright finish on zinc galvanized wire comprising: water quenching bath means for quenching the wire while the zinc coating is still in a molten condition, said water quenching means being mounted for receiving said wire following its passage through a molten zinc bath, burner means interposed between the water quenching means and the molten zinc bath and directed at the wire for maintaining the zinc coating on the wire in a molten condition until the wire

enters the water quenching means, and means interposed between said water quenching means and said burner means for



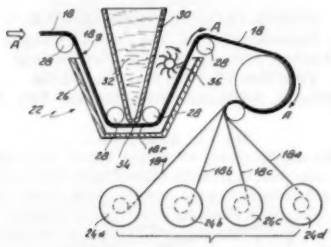
substantially preventing water from the quenching means from leaking into the zinc bath.

4,177,755

APPARATUS FOR DUSTING AN ELASTOMERIC SURFACE

Deregibus Alfio, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 13, 1977, Ser. No. 841,786
Claims priority, application Italy, Apr. 5, 1977, 23159 A/77
Int. Cl.[2] B05C *5/00, 11/02*
U.S. Cl. 118—118 **2 Claims**



1. Apparatus, for the application of a film of zinc stearate powder onto tape incorporating textile material and having a layer of vulcanizable elastomer exposed at one face of the tape, comprising:

(i) first and second roller means about which said tape may be entrained with the elastomer face thereof contacting said roller means, the roller means being spaced and positioned such that a portion of said tape between the roller means is substantially horizontal and has the elastomer face exposed upwardly; p1 (ii) a feedbox, to contain zinc stearate powder, having at its lower part at least one slit positioned transversely of the tape and extending for the entire width of the tape for the emergence of the zinc stearate powder, said feedbox being disposed with its lower part positioned between said first and second roller means and closely spaced above said substantially horizontal portion of said tape, for even distribution of zinc stearate dust onto said tape portion;

(iii) third roller means, at a level above that of the first and second roller means, about which said tape may be entrained such that a further portion of said tape, downstream of said substantially horizontal portion thereof and between said second and third roller means, is inclined upwardly, and

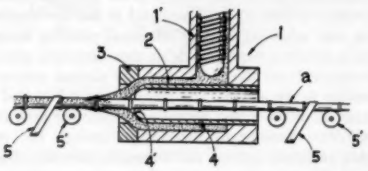
(iv) brush means disposed to contact the stearate-dusted face of said further tape portion between said second and third roller means, for the removal from said further tape portion of any excess stearate dust thereon.

4,177,756

SURFACE COATING DEVICE OF BAMBOOS

Syozo Shigematsu, 9-9,4-chome, Habikigaoka, Habikino, Osaka-fu, Japan

Filed Jul. 12, 1977, Ser. No. 814,913
Claims priority, application Japan, Aug. 3, 1976, 51-103590[U]
Int. Cl.[2] B05C *3/10*
U.S. Cl. 118—404 **2 Claims**



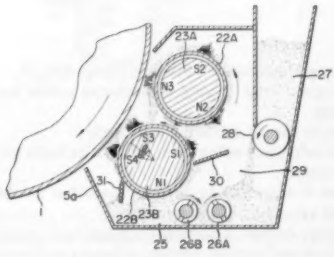
1. A device for the coating of bamboos with synthetic resin comprising a die, a synthetic resin chamber communicating with said die, a push mechanism for said synthetic resin, a nozzle tube having an opening wide enough for passage therethrough of bamboo whose outside diameter varies constantly due to knots, centrally located and affixed within said chamber, said tube having a downwardly curved end portion forming an outlet located and within the opening of said die over which end portion say synthetic resin flows onto said bamboo without filling said die opening, a feeding mechanism positioned in front of said device and a feeding mechanism positioned in back of said device, each of said mechanisms comprising a belt and roller combination for moving the bamboo at a fixed speed while giving it a constant rotation.

4,177,757

MAGNETIC BRUSH DEVELOPING DEVICE FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Syuzi Murakawa; Toshirou Kasamura, and Yujiro Ando, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,438
Claims priority, application Japan, Jan. 7, 1977, 52-585
Int. Cl.[2] G03G *13/09*
U.S. Cl. 118—658 **15 Claims**



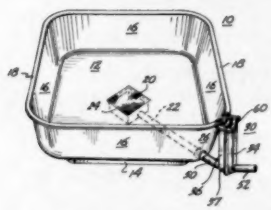
1. A device for developing latent images carried on a movable surface, comprising:

a container for containing developer therein;
first magnetic means supported in said container for producing a first magnet field, said first magnetic means having a single magnetic pole disposed at a developing position opposed to the surface to be developed;
a first non-magnetic member interposed between the surface to be developed and said first magnetic means, said first non-magnetic member being movable relative to said first magnetic means in the same direction as the movable surface to be developed at the developing position;
a second magnetic means supported in said container in spaced relation to said first magnetic means for producing a second magnetic field, said second magnetic means having adjacent magnetic poles of identical polarity disposed at the developing position;
a second non-magnetic member interposed between the surface to be developed and said second magnetic means, said second non-magnetic member being movable relative to said second magnetic means in the same direction as the movable surface to be developed at the developing position, said adjacent poles of identical polarity being effective to produce repelling fields therebetween which repel developer from the surface of the second non-magnetic member at the developing position, said first and second magnetic means being arranged to provide downward or horizontal passage of developer through the repelling fields and said second non-magnetic member being disposed downstream of said first non-magnetic member with respect to the movement direction of the surface to be developed; and
means for applying developer from said container only to said first non-magnetic member for development of a latent image on the movable surface, the developer then being transported from said first non-magnetic member to the second non-magnetic member to further develop the latent image by another application of developer.

4,177,758
REARING APPARATUS FOR FISH FRY

Dale E. Young, II, Rte. 4, Box 4915-Z, Juneau, Ak. 99803; David K. Elie, 13551 35th Ave. NE., Seattle, Wash. 98125, and Peter K. Schoening, 5807 NE. 151st Ave., Bothell, Wash. 98011

Filed Jan. 30, 1978, Ser. No. 873,203
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **7 Claims**

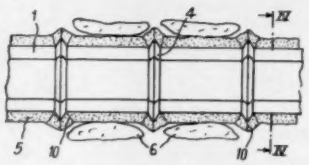


1. Rearing apparatus for fish frys comprising:
a rectangular tank having a discharge outlet basin in the bottom;
foraminous means screening said basis;
a first conduit extending from said outlet basin to beneath a tank corner;
a second conduit having its axis disposed at an obtuse angle to the axis of said first conduit;
a smoothly curved transitional conduit connecting between said first and second conduits whereby to form a continuous stress-relieving passage for fish fry;
wall means connected with and rising above said transitional conduit and being in flow communication with said stress-relieving passage and forming an upright weir chamber; and
means forming a vertically movable weir in said chamber normally blocking said passage to such a degree as to govern the water depth in said tank.

4,177,759
APPARATUS AND METHOD FOR COLLECTING OYSTERS

Guy Mahéo, Lezardrieux, France, assignor to Societe Civile G. M. Maheo - Conseil, Lezardrieux, France

Filed Aug. 8, 1977, Ser. No. 822,992
Claims priority, application France, Aug. 11, 1976, 76 24510
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 **7 Claims**

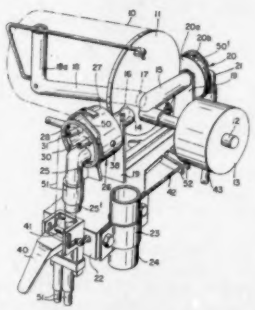


1. A frame with a series of parallel bars attached, which forms a grill for collecting oysters, wherein the improvement comprises a series of ribs, encircling at least some of said bars, said ribs being spaced slightly greater than the length of one oyster apart and rising above said bars; a lime coating formed over said bars and said ribs, the height of said ribs being substantially less than the thickness of said lime coating which is formed on said bars.

4,177,760
LIQUID FLOW SENSING DEVICE

Paul Slater, Palmerston North, New Zealand, assignor to Delta Plastics Limited, Palmerston North, New Zealand

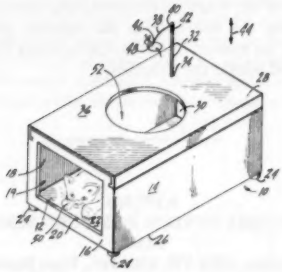
Filed Feb. 10, 1978, Ser. No. 876,524
Claims priority, application New Zealand, Feb. 11, 1977, 183315
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **20 Claims**



1. A valve unit for a liquid flow sensing device of the type having a control means which is movable between first and second positions when the flow rate is respectively low and high but biassed to the said first position, said valve unit comprising:
a fluid inlet;
a fluid outlet;

a first section movable in response to movement of said control means;
a second section;
a fluid flow passage connecting said inlet and outlet;
first and second ports;
a third section which is movable independently of said first and second sections and has means for disconnecting said flow passage from said inlet and outlet;
means for connecting said first and second ports together; and
means for coupling said third section to said first section such that as said control means moves from said second position to said first position it moves both the first and third sections relatively to said second section so that the flow passage is disconnected from said inlet and outlet and said first and second ports are connected by said port connecting means.

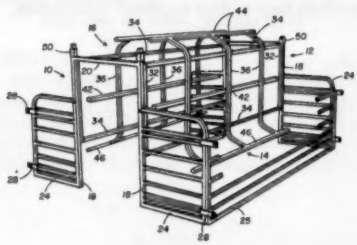
4,177,761
PET PLAY HOUSE
Louis Bellocchi, Jr., 60 Newport Rd., Island Park, N.Y. 11558
Filed Sep. 30, 1977, Ser. No. 838,100
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—19 **8 Claims**



1. A pet play house apparatus comprising a plurality of walls, a base, said walls fixedly secured to said base, said walls defining an open-mouth portion opposite and above said base, a unitary opening in said walls whereby a pet may pass there through into the enclosure formed by said walls and said base, a lid, means to slidably engage said lid with said walls whereby said lid may be disposed entirely covering said open-mouth portion, said lid having an access opening therein, said access opening being smaller than said open-mouth portion, a dowel, one end of said dowel fixably secured to an exterior lateral surface of said lid, the other end of said dowel extending upwardly from said lid, a wire-like element, means to slidably frictionally engage one end of said wire-like element at selected locations along the length of said dowel, a toy, said toy carried by the free end of said wire-like element, said toy being located adjacent said opening in said lid.

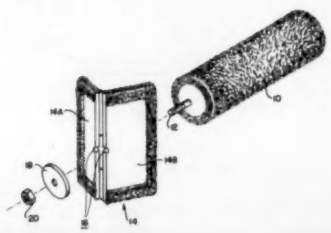
4,177,762
FARROWING CRATE
Norbert R. Borcherding, Box 128, Garnavillo, Iowa 52049
Filed May 30, 1978, Ser. No. 910,199
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—20 **6 Claims**

1. A farrowing crate for sows and the like, said crate comprising spaced-apart front and rear panels, side panels combined with said front and rear panels to form a generally rectangular enclosure, each of said side panels having a central portion and an upper portion extending inwardly from the central portion and a lower portion extending outwardly from the central portion in a direction opposite to the upper portion, the central portion of each said side panels being pivotally joined to the front and rear panels for pivotal movement of the side panel about a substantially horizontal axis, the perpendicu-



lar distance from the plane of the central portion of each side panel to the outer edge of the upper portion being greater than the perpendicular distance from the plane of the central portion to the outer edge of the lower portion when said side panel is positioned with the upper portion at the top, and means for maintaining each side panel in a selected position with the upper portion positioned either above the central portion or below the central portion so that the width of the enclosure can be varied.

4,177,763
CAT SCRATCHING POST ASSEMBLY
Weldon R. Cook, 30700 Manzano Dr., Malibu, Calif. 90265
Filed Apr. 17, 1978, Ser. No. 896,892
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **4 Claims**



1. A scratching post assembly for cats, and other household pets, comprising: an elongated post; carpeting material covering said post; a stud protruding downwardly from the lower end of said post; a two-piece base comprising a first planar section and a second planar section having edges adjacent to

one another; carpeting material covering said base and causing the adjacent edges of said first and second planar sections to be hinged to one another so as to permit the base to be closed to a first position in which the first and second sections are folded against one another, and to be opened to a second position in which the first and second sections are in co-planar relationship with respect to one another, said first and second sections defining a hole on the hinge line for receiving said stud; and fastening means engaging said stud on the opposite side of the base from the post to secure the post in an upright position on the base and to cause the post to hold the first and second sections of the base in their co-planar relationship.

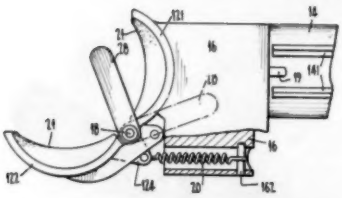
4,177,764

ANIMAL LEG CLAMP APPARATUS

William R. C. Geary, F.4/18 Kensington Rd., South Yarra, Victoria, Australia (3141)

Filed Jul. 11, 1977, Ser. No. 814,799
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **8 Claims**

1. Animal leg clamp apparatus comprising, a carrier, a fixed clamp member associated with said carrier, a coacting clamp member pivotally connected to said fixed clamp member for movement towards and from said fixed clamp member to close and open the clamp respectively, at least one return spring connecting said carrier to said coacting clamp member for normally maintaining said coacting clamp member in its open position, a hydraulic cylinder fixed relative to said carrier and which in use is connected to a fluid reservoir, a slidable plunger in the cylinder, and means for transmitting motion



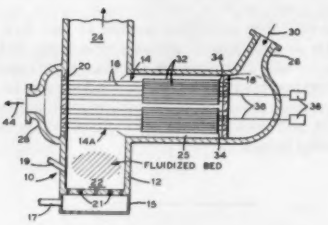
from the plunger to the coacting clamp member thereby to close the clamp in opposition to the return spring, and wherein, as said coacting clamp member closely approaches its fully open position, the line of action of said means for transmitting motion thereto passes over the pivotal axis thereof, thereby to lock said coacting clamp member in its open position, and actuating means operatively connected to the coacting clamp member for imparting initial closing movement to the coacting clamp member, thereby to permit the clamp to be re-closed by the plunger.

4,177,765

OUTPUT CONTROL FOR FLUIDIZED BED BOILERS

Allen E. Wehrmeister, Lynchburg, Va., assignor to The Babcock & Wilcox Co., New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,299
Int. Cl.[2] F22B *1/02;* **F23D** *19/02*
U.S. Cl. 122—4 D **8 Claims**



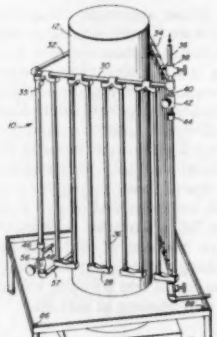
1. In combination with a vapor generator having a combustion chamber fired by a fluidized bed of granular material, a multiplicity of heat exchanger tubes arranged within the generator to form at least one tube bank for heating fluids flowing therethrough, a heat shielding apparatus which comprises a plurality of slidable insulating sleeves, the sleeves circumscribing a portion of the length of the tubes, and means for supporting and sliding the sleeves over the exposed portion of the tubes to vary the amount of tubular surface area exposed to the heat generated within the chamber.

4,177,766

HEAT RECOVERY SYSTEM FOR FURNACES AND THE LIKE

Edward S. Richter, 1591 SW. 65th Ter., Boca Raton, Fla. 33432

Filed Jun. 2, 1978, Ser. No. 911,715
Int. Cl.[2] F22B *1/02;* **F22D** *1/00*
U.S. Cl. 122—20 B **5 Claims**



1. A system for recovering heat from the stack of a furnace or the like, comprising

(a) a plurality of straight, rigid support pipes connected in end-to-end relation to define a closed geometric figure mountable horizontally about the exterior of said stack with each of said pipes extending in close relation to said stack,

(b) a plurality of parallel pipe lengths forming a section depending from each support pipe, said pipe lengths being connected at alternating ends to define a plurality of coplanar reversing bends in each section of pipe lengths,
(c) valve means connected to the first and last lengths of pipe in each section for selectively opening and closing a flow path through said section,
(d) means connecting said system to a water supply source whereby water flowing through said system will be heated by the heat from said stack, and
(e) an insulated housing substantially enclosing said system.

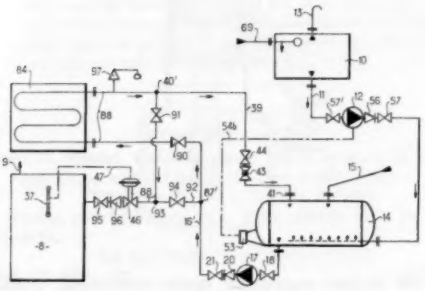
4,177,767

METHOD AND DEVICE FOR FEEDING A SYSTEM OF GENERATION AND DISTRIBUTION OF VAPOR CONDENSABLE INTO MAKE-UP LIQUID

Pierre E. Regamey, 35 Le Calabert, Ecully, France (69130)

Filed Nov. 12, 1976, Ser. No. 741,339
Claims priority, application France, Nov. 13, 1975, 75 34705; Sep. 13, 1976, 76 27510; Sep. 13, 1976, 76 27511
Int. Cl.[2] F22D *5/30*
U.S. Cl. 122—456 **42 Claims**

1. A closed loop system having at least one vapor producing evaporating boiler, at least one vapor utilizing condenser, and at least one condensate recovery collector, an improved automatic and continuous method of recovering and distributing condensate within such system and of introducing fresh liquid into the system, wherein said condensate and liquid is binary consisting of vapor and a liquid phase (condensates) and is at pressures and temperatures approximately constant everywhere and identically equal (disregarding the local flow-pressure losses) in the system between a point of supply of vapor to and across the vapor utilizing condenser and a point of delivery of the condensates to the said condensate collector, with



recovery of at least the most part of the condensates by natural return-flow to the collector tank, the said method consisting in replenishing the boiler from two sources of make-up liquid constituted respectively, on the one hand, by a supply of external input feed-liquid and on the other hand, by the recovered condensates, and of providing a supply flow-rate which may be controlled automatically according to the instant sensed level of liquid in the collector tank within a defined range of controlled values between two limits, viz. an upper or feed shut-down limit and a lower or maximum feed flow-rate limit, and of providing introduction of the make-up liquid from the collector tank directly into the boiler by forced circulation, according to the instant sensed level of liquid in the boiler within a defined range of controlled values between two limits, viz. an upper or feed shut-down limit and a lower or maximum flow rate limit, and where the reintroduction is continuous and depends only on the actually detected physical presence of the condensates and the interlocked follow-up relationship with the sensed level of liquid in the boiler.

4,177,768

FUEL COMPOSITIONS

Bryan T. Davis, West Bloomfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 19, 1979, Ser. No. 4,716
Int. Cl.[2] C10L *1/18*
U.S. Cl. 123—1 A **39 Claims**

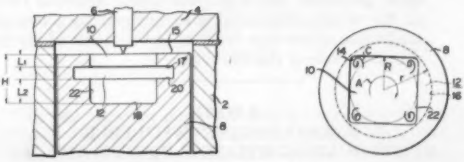
1. As a new composition of matter, an anti-wear compression ignition fuel for use in diesel engines comprising (1) a monohydroxy alkanol having from 1 to 5 carbon atoms, (2) an ignition accelerator, and (3) a wear inhibiting amount of a dimerized unsaturated fatty acid and an ester of a phosphorus acid.

4,177,769

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE

Masaru Okada, and Seikichi Kanai, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,229
Claims priority, application Japan, Oct. 18, 1976, 51/138872
Int. Cl.[2] F02B *23/06*
U.S. Cl. 123—30 D **3 Claims**



1. In an internal combustion engine of the direct injection type including combustion chambers each defined by a cylinder head, a cylinder liner and a piston head having a wall defining a cavity therein, means for producing air swirl in said cavity, and fuel injection means each having a plurality of fuel injection nozzles, said fuel injection means being mounted substantially at the central part of said cavity, said nozzles being arranged to inject jets of fuel into said cavity radially against said cavity wall, the improvement wherein said cavity wall is constructed to define a generally equilateral polygonal cavity formed in said piston head and a generally concentric circular shaped cavity formed in the generally intermediate part of the depth of said equilateral polygonal cavity.

4,177,770

COMPENSATION OF SENSOR VOLTAGE FOR REFERENCE POTENTIAL VARIATION

Robert L. Anderson, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 7, 1978, Ser. No. 940,421
Int. Cl.[2] F02B *3/08;* **F01N** *3/08*
U.S. Cl. 123—32 EE **10 Claims**

1. An improved electrical system of the type which comprises:
(a) a source of electrical energy having a source reference terminal and an other terminal across which terminals is developed a potential difference or EMF usable as a supply voltage for said electrical system;
(b) means for generating a sensor signal voltage, said means

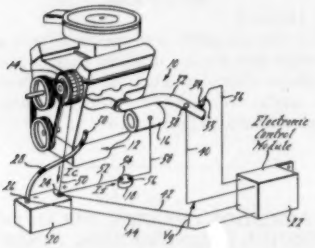
having first and second terminals across which said sensor voltage is generated;

(c) an electronic circuit adapted to respond to said sensor signal voltage, said electronic circuit using the potential at said source reference terminal as the reference potential for said electronic circuit;

(d) conductive means for coupling said second terminal of said signal generating means to said source reference terminal; and

(e) means for causing currents of varying character to flow through said conductive means;

wherein the improvement comprises:



(f) means for generating a compensated sensor signal voltage, said compensated sensor signal voltage being equal or proportional to said sensor signal voltage as it appears across said first and second terminals, said compensated sensor signal voltage being referenced to the potential of said source reference terminal and being compensated, as compared to the voltage between said first terminal of said signal generating means and said source reference terminal, for varying potential differences appearing across said conductive means as a result of said currents of varying character flowing therethrough.

4,177,771

ROTARY ENGINES WITH FREE RECIPROCATING-ROTATING PISTONS AND JET THRUST DRIVE

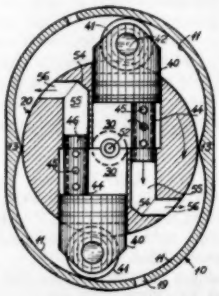
Ata Nutku, Dumen Sokak 5/1-D.12, Gumussuyu, Istanbul, Turkey

Filed Jan. 19, 1977, Ser. No. 760,692

Claims priority, application Turkey, Aug. 12, 1976, 72355

Int. Cl.[2] F02B *57/04*

U.S. Cl. 123—43 C **28 Claims**



1. A rotary engine comprising a stator casing containing a rotor, said rotor having at least one cylinder cavity therein containing a reciprocating piston that has an outer end with means engaging a wall of said casing and that has an inner end provided with an eccentric tail-rod that reciprocates in a well and prevents rotation of the piston, the configuration of said casing and said rotor being correlated so that said piston moves in and out of said rotor as the rotor turns with said piston in contact with said casing wall, means for admitting a working fluid to said cylinder cavity for urging said piston out of said rotor, and means for exhausting said fluid from said cylinder cavity as a jet from the periphery of said rotor, whereby said rotor is driven by the exhausting of said fluid from said cylinder cavity and by the reactive forces of the casing wall upon said piston.

4,177,772

METHOD OF OPERATING A FOUR-STROKE INTERNAL COMBUSTION ENGINE AND INTERNAL COMBUSTION ENGINE FOR CARRYING OUT THIS METHOD

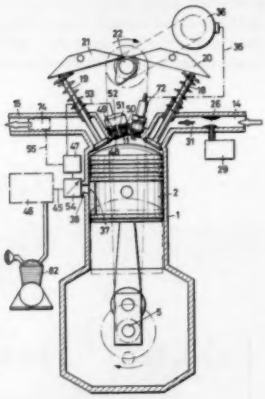
Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 755,007

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1976, 2600014

Int. Cl.[2] F02B *75/10*

U.S. Cl. 123—75 B **14 Claims**



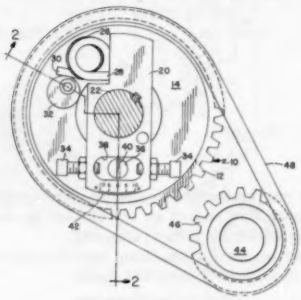
1. An internal combustion engine comprising: cylinder means; piston means operably reciprocable within said cylinder means; inlet means for introducing a combustible fuel-air mixture into said cylinder means; ignition means for igniting said mixture; exhaust means for removing combustion gases from said cylinder means; aperture means defined to extend in flow communication with said cylinder means; source means for supplying an additional fluid into said cylinder means through said aperture means; valve means interposed between said source means and said aperture means for controlling the flow of said additional fluid therebetween; sensing means for sensing combustion pressure within said cylinder means; valve control means responsive to said sensing means for controlling operation of said valve means in accordance with the sensed value of combustion pressure within said cylinder means; means for sensing the composition of said combustion gases in said exhaust means; and further valve control means responsive to said composition sensing means for controlling jointly with said valve control means operation of said valve means in response to sensed composition of said combustion gases.

4,177,773

DAMPED AUTOMATIC VARIABLE VALVE TIMING DEVICE FOR INTERNAL COMBUSTION ENGINES

John R. Cribbs, 6034 Soledad Mountain Rd., La Jolla, Calif. 92037

Filed Dec. 27, 1977, Ser. No. 864,664
Int. Cl.[2] F01L *1/34*
U.S. Cl. 123—90.15 4 Claims



1. An automatic variable cam drive for internal combustion engines having a crankshaft and a camshaft, said cam drive comprising:

a face plate fixed to a camshaft;

a sprocket mounted for limited rotation on said face plate axially of said camshaft and positively driven in one direction by a crankshaft;

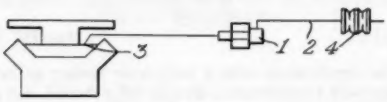
a resilient drive coupling operatively mounted on and between said face plate and sprocket and producing a bias in said face plate and camshaft to turn with said sprocket in said direction, whereby gas load reaction to high crankshaft rpm overcomes said bias and said face plate and camshaft have a relative shifting movement to a rotationally retarded position to give a like retarded valve timing; and spring means operatively positioned between said face plate and the positively driven sprocket to dampen and smooth out said shifting movement.

4,177,774

CONTROL VALVES

John H. Moshal, Westville, South Africa, assignor to Control Logic (Proprietary) Limited, Durban, South Africa

Filed Jun. 21, 1976, Ser. No. 698,408
Claims priority, application South Africa, Jun. 25, 1975, 75/4076
Int. Cl.[2] F02D *11/10, 28/00, 31/00*
U.S. Cl. 123—102 4 Claims



1. A solenoid operated valve for a vehicle engine control system comprising:

a hollow body of non-magnetic material having an inlet and a first outlet axially aligned with each other;

valve seats provided at said inlet and first outlet;

a hollow piston of magnetic material having a head at each end and slidable in said body between positions where said heads respectively communicate with said valve seats to close the inlet or first outlet from communicating with the interior of said body;

ports provided in said piston wall which are in communication with a normally open second outlet provided in said hollow body, said second outlet being fluidly coupled with said inlet and first outlet, the fluid flow passing between said inlet and second outlet and between said first and second outlets being adjustably varied in dependence on the position of said hollow piston, the fluid flow path between said second outlet and said inlet being configured to provide a considerable constriction to fluid flow; and,

a solenoid coil for controlling the position of said piston,

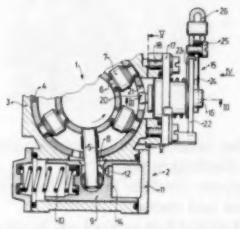
said inlet port being open to ambient air, said first outlet being connectable with a vacuum line of said engine, and said second outlet being connectable with a vacuum operated servo mechanism provided on said engine.

4,177,775

FUEL INJECTION PUMP

Gerald Höfer, Flacht; Karl Konrath, Ludwigsburg; Manfred Schwarz, Gerlingen, and Willi Müller, Sulz, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,171
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729807
Int. Cl.[2] F02M *39/00;* F04B *19/02*
U.S. Cl. 123—139 AP 14 Claims



1. A fuel injection pump for internal combustion engines provided with a cam drive mechanism arranged to actuate at least one pump piston, said cam drive mechanism comprising a ring stationarily mounted in the pump housing and being rotatable by means of a device operating in dependence on the speed, and adpated to adjust the onset of injection, comprising a stop means arranged to limit the twisting angle (α) of said ring and further being adjustable by way of another device which engages into at least one corresponding recess of said ring.

4,177,776

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noriaki Kawai, Okazaki; Hisaji Okamoto, Aichi; Yosiaki Takeda, Nagoya; Fukuzi Sano, Kariya; Akio Kakiuchi, Nagoya; Masami Manabe, Kariya; Takashi Nomura, Kariya, and Sigeya Abe, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Kabushiki Kaisha, Kariya, both of, Japan

Division of Ser. No. 635,069, Nov. 25, 1975, Pat. No. 4,068,633, which is a division of Ser. No. 386,874, Aug. 9, 1973, Pat. No. 3,930,474, which is a continuation of Ser. No. 116,343, Feb. 18, 1971, abandoned. This application Oct. 5, 1977, Ser. No. 839,557
Claims priority, application Japan, Feb. 27, 1970, 45-17189; Mar. 30, 1970, 45-30471[U]; Apr. 9, 1970, 45-34366[U]; Apr. 9, 1970, 45-34367[U]
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 A 14 Claims

1. An ignition system for an spark-ignition type internal combustion engine comprising an ignition device capable of performing the spark timing control function, and a temperature detecting element for detecting the temperature having an effect on the engine torque efficiency, whereby said ignition

device is operated so that the spark timing under a low temperature condition is advanced as compared to that used under a high temperature condition according to the temperature detected by said temperature detecting element,

wherein said ignition device comprises a housing for said ignition device; and

a vacuum spark advance mechanism secured to said housing,

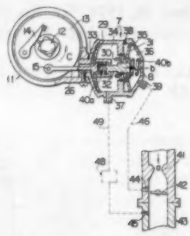
said vacuum spark advance mechanism including first, second and third diaphragms disposed within a single casing,

a first control rod secured at one end thereoi to said first diaphragm,

a second control rod secured at one end thereof to said second and third diaphragms,

said one end of said first control rod and the other end of said second control rod being slidably interconnected by way of a compression spring disposed therebetween,

a first vacuum chamber defined between said first diaphragm and said second diaphragm,



an air chamber defined between said second diaphragm and said third diaphragm, and

a second vacuum chamber defined between said third diaphragm and said casing,

the other end of said first control rod being connected to the movable breaker plate,

said first vacuum chamber being communicated through a temperature change-over valve with a first vacuum intake port disposed in an inlet pipe downstream of a carburetor throttle valve,

said second vacuum chamber being directly communicated with a second vacuum intake port disposed slightly upstream of the fully closed position of said carburetor throttle valve, whereby said temperature change-over valve exposes said first vacuum chamber to the atmosphere when the engine temperature is high, and said temperature change-over valve communicates said vacuum chamber to said first vacuum intake port when the engine temperature is low.

4,177,777

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Kimiomi Maruyama, Yokohama; Yoshitaka Hata, Fujisawa, and Akihiro Ohnishi, Koshigaya, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1977, Ser. No. 824,316

Claims priority, application Japan, Aug. 23, 1976, 51-100435

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**

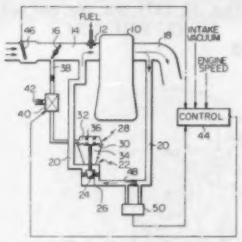
1. A system for controlling the flow of exhaust gas recirculated from an exhaust passage of an internal combustion engine to an induction passage of the engine through an exhaust recirculation passage, the system comprising:

a flow control valve to vary an effective cross-sectional area of the exhaust recirculation passage;

a first flow sensing means for sensing the volume flow rate of air in the induction passage and producing a first electrical signal representing the sensed flow rate;

a second flow sensing means for sensing the volume flow rate of exhaust gas in the recirculation passage and producing a second electrical signal representing the sensed flow rate;

a control means for producing a third electrical signal representing a deviation of the ratio of the volume flow rate of



exhaust gas represented by said second electrical signal to the volume flow rate of air represented by said first electrical signal from a preset ratio; and

an actuator means for operating said control valve in response to said third electrical signal.

4,177,778

CARBURETORS WITH HEATING DEVICE

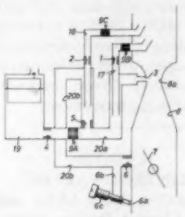
Takashi Naitou, Kariya; Masaharu Sumiyoshi; Osamu Ito, both of Toyota; Nobuhito Hobo, Inuyama, and Yutaka Suzuki, Nishio, all of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kobyo Kabushiki Kaisha, both of Aichi, Japan

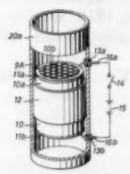
Filed Jul. 21, 1977, Ser. No. 817,706

Claims priority, application Japan, Jul. 29, 1976, 51/90602; Nov. 29, 1976, 51/143891; May 6, 1977, 52/52317

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 F **9 Claims**





1. In combination with a carburetor having an induction passage with a venturi and a throttle valve therein, fuel passage means for supplying liquid fuel from a fuel chamber into said induction passage, and air passage means for inducing the air from an upstream portion of the venturi into the fuel passage means: a heating device comprising a plurality of honeycomb heater elements coaxially disposed within one said fuel and air passage means through a cylindrical insulator to heat the fluid passing therethrough, each of said honeycomb heater elements being made of a ceramic composition having a positive temperature coefficient of resistance and being provided at the opposite ends thereof with a pair of electrodes which are connected in parallel with each other and also connected with an electric power source, whereby the liquid fuel or air is heated by said heating device when the temperature of liquid or air is lower than a critical temperature defined by the ce-

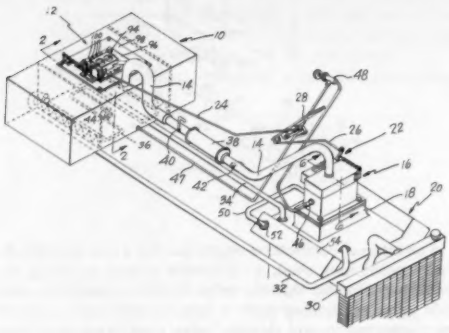
ramic composition of said respective honeycomb heater elements.

4,177,779

FUEL ECONOMY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Thomas H. W. W. P. Ogle, 9028 Mt. Delano, El Paso, Tex. 79924

Filed Jul. 20, 1977, Ser. No. 817,243
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—133 **32 Claims**



1. A fuel vapor system for an internal combustion engine having an intake manifold, which comprises:

(a) tank means for containing fuel vapor;

(b) vapor equalizer means mounted on and in fluid communication with said intake manifold of said engine;

(c) vapor conduit means connecting said tank means to said vapor equalizer means for delivering fuel vapor from the former to the latter;

(d) said vapor equalizer means having first valve means connected thereto for controlling the admission of air to said vapor equalizer means;

(e) said tank means having second valve means connected thereto for controlling the admission of air to said tank means; and

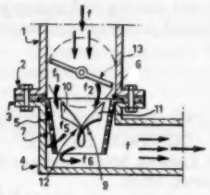
(f) throttle means for controlling said first and second valve means so that the opening of said first valve means precedes and exceeds the opening of said second valve means.

4,177,780

DEVICE FOR INCREASING THE UNIFORMITY OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

Albert Pellerin, 35 rue Lambrechts, 92400 Courbevoie, France

Filed Nov. 16, 1977, Ser. No. 851,971
Claims priority, application France, Nov. 16, 1976, 76 34414
Int. Cl.[2] F02M *29/00*
U.S. Cl. 123—141 **2 Claims**



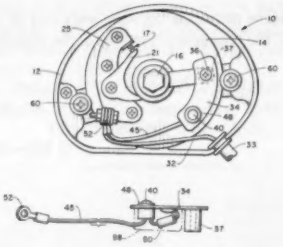
1. In a device for internal combustion engines for increasing the uniformity of the air-fuel mixture, comprising a frusto-conical element formed by a perforated lateral wall having a collar at its major opening, the collar being adapted to fit between the carburetor flange and the manifold flange of an internal combustion engine whereas the apex of the truncated cone extends into the manifold inlet of said engine; the improvement comprising a single additional internal component in the form of a plate shaped and curved to form a spiral so as to produce turbulence and send the mixture against the walls of the truncated cone, the spiral being disposed within the truncated cone and end portions of the spiral being secured to the truncated cone and the mid-portion of the spiral between said end portions extending into the truncated cone more closely adjacent said apex and said end portions being disposed more closely adjacent said major opening of said truncated cone.

4,177,781

ELECTROMECHANICAL ENGINE TIMING DEVICE

Ronald L. Marchelletta, and Charles W. Wheeler, both of Thousand Oaks, Calif., assignors to Moto-Tronics, Pacific Palisades, Calif.

Continuation of Ser. No. 604,678, Aug. 14, 1975, abandoned.
This application Nov. 11, 1977, Ser. No. 850,573
Int. Cl.[2] F02P *17/00*
U.S. Cl. 123—146.5 A **3 Claims**



1. An electromechanical engine timing device comprising:

an arcuate bracket formed to fit internally in an ignition system distributor having one or more breaker points;

at least one light-emitting diode securely mounted in a hole in said bracket;

current-limiting means connected between one side of said light-emitting diode and said bracket whereby when said bracket is secured in the distributor the plate acts as the ground terminal;

protective insulating means encapsulating the rear portion of said light-emitting diode and said current-limiting means; and

connecting means connecting the other side of said light-emitting diode in parallel with said breaker points whereby said light-emitting diode continuously indicates the opening and closing of said breaker points.

4,177,782

IGNITION SYSTEM PROVIDING SPARKS FOR TWO IGNITION PLUGS IN EACH CYLINDER FROM A SINGLE IGNITION COIL

Takashi Yoshinari, and Terumi Ookado, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1977, Ser. No. 846,891
Claims priority, application Japan, Nov. 1, 1976, 51/130493
Int. Cl.[2] F02P *3/02*; H05B *41/02*
U.S. Cl. 123—148 C **7 Claims**

1. An ignition system for an internal combustion engine having at least one cylinder, comprising:

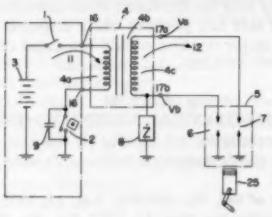
an ignition coil having a primary winding and a secondary winding, said secondary winding having two output terminals;

an ignition control circuit for applying a charging current to the primary winding of the ignition coil and for interrupting said charging current;

two ignition plugs provided for each cylinder of the engine, each said ignition plug having at least one gap formed by two spaced apart electrodes,

first connecting means for connecting one of the spaced apart electrodes of each gap of the two plugs to ground;

second connecting means for connecting the other spaced apart electrode of one of the two plugs to one output terminal of the secondary winding of the ignition coil;



third connecting means for connecting the other spaced apart electrode of the other of the two plugs to the other output terminal of the secondary winding of the ignition coil; and

impedance means provided between only one of the output terminals of the secondary winding of the ignition coil and ground.

4,177,783

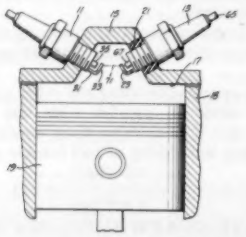
DUAL SPARK PLUG IGNITION SYSTEM

Osvaldo Palomeque, 4116 ½ N. Peck Rd., Apt. C, El Monte, Calif. 91732

Filed Nov. 3, 1978, Ser. No. 957,535

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—148 C **9 Claims**



1. An ignition system for an internal combustion engine for reducing the amount of air pollutants in the exhaust gases thereof, comprising:

(a) a first spark plug having central and side electrodes and being mounted upon a cylinder of said engine and electrically grounded to said cylinder; and

(b) a second spark plug having central and side electrodes and being mounted upon said cylinder and electrically insulated therefrom, said first and second spark plugs being separated by an air gap and angularly disposed with respect to each other and being operatively connected to electrical distributor means which causes an electric spark to jump said air gap between said first and second spark plugs.

4,177,784

ENGINE STARTING DEVICE

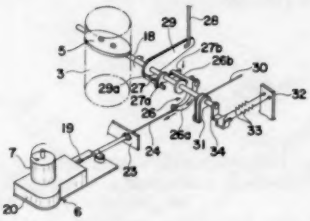
Yasuo Tatsutomi; Hideo Shiraishi, and Takashi Hamamoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 16, 1977, Ser. No. 861,446

Claims priority, application Japan, Dec. 21, 1976, 51/172023[U]

Int. Cl.[2] F02N *17/00*; F02C *33/04*

U.S. Cl. 123—179 G **4 Claims**



1. In an internal combustion engine having a rotatable throttle valve positioning shaft, a carburetor system including an openable and closable throttle valve fixedly mounted on said throttle valve positioning shaft, a main throttle valve control means connected to said throttle valve positioning shaft and externally actuable to turn said throttle valve positioning shaft in a first direction for causing said throttle valve to open, a throttle valve return means exerting a constant force on said throttle valve positioning shaft to turn said throttle valve shaft in a second direction for causing said throttle valve to close, a cranking motor, and a cranking motor power supply circuit including a starter switch which is closable by external action to close said cranking motor power supply circuit, an engine starting device, comprising:

subsidiary throttle valve control means including a first lever means rotatably mounted on said throttle valve positioning shaft, and a second lever means which is fixedly mounted on said throttle valve positioning shaft and is engaged by said first lever means for being moved thereby in said first direction, and which under the force of said throttle valve return means transmitted through said throttle valve positioning shaft is rotatable in said second direction for simultaneously rotating said first lever means in said second direction;

drive means connected to said first lever means for actuating said subsidiary throttle valve control means for rotating said throttle valve positioning shaft in said first direction;

a drive means power supply circuit which connected in parallel to said cranking motor power supply circuit and being closable to energize said drive means and having a normally open thermo-switch therein which is closable to close said drive means power supply circuit; and

temperature detection means connected to said thermoswitch for detecting the temperature in at least one portion of said engine and causing said switch to close when the temperature in said portion of said engine exceeds a certain set value.

4,177,785

DIESEL ENGINE GLOW PLUG ENERGIZATION CONTROL DEVICE

Arthur R. Sundeen, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 846,917, Oct. 31, 1977, abandoned. This application May 12, 1978, Ser. No. 905,335

Int. Cl.[2] F02N *17/00*

U.S. Cl. 123—179 H **8 Claims**

1. In combination:

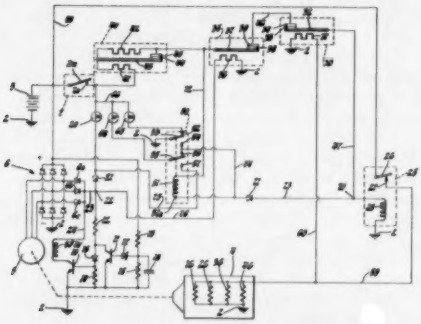
a Diesel engine having at least one glow plug having a

resistance element heatable to a mixture-igniting temperature range of the order of 900° C. to facilitate engine starting under cold conditions, the glow plug being characterized by decreased temperature rise per unit of heating power while the temperature thereof is within said mixture-igniting temperature range and the engine being capable of starting without significant glow plug action at a predetermined self-igniting temperature of the order of 80° C.;

a thermostatic switch adapted to complete an electric circuit when below said self-igniting temperature and to interrupt the circuit when above said self-igniting temperature;

means to energize said glow plug when said switch completes the electric circuit and to deenergize said glow plug when said switch interrupts the electric circuit;

resistive heater means energized when said glow plug is



energized to heat said switch in accordance with current flow supplied said heater means at a rate such that at a predetermined low engine starting temperature of the order of −18° C. said glow plug reaches said mixture-igniting temperature range at the time said switch reaches said self-igniting temperature; and

means communicating the engine temperature to said thermostatic switch independently of the said last means so that said switch partakes of the engine temperature and interrupts said circuit in the absence of heating by said last means when the engine temperature is at or above said self-igniting temperature,

said combination being so constructed and arranged that over a substantial engine temperature range between said predetermined low engine starting temperature and said self-igniting temperature said glow plug is heated above the temperature required to assist engine start.

4,177,786

LUBRICANT FEEDING MEANS

Wulf Leitermann, Bad Wimpfen, and Rolf Lechler, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

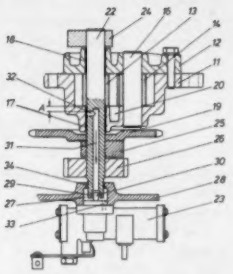
Continuation of Ser. No. 637,990, Dec. 5, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,600

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 2458086

Int. Cl.[2] F01M *1/00*

U.S. Cl. 123—196 R **7 Claims**

1. A lubricant system which includes in combination a metering pump and means for providing filtered lubricant to the metering pump, said means comprising at least one shaft, a bearing surface for the shaft mounted in journal bearing, a means for forcing a lubricant through the gap between the bearing surface and shaft so that particles larger than the size of said gap will be unable to pass through, and a passage for



conveying the lubricant forced through said gap to the metering pump.

4,177,787

DETERIORATED CONDITION DETECTING APPARATUS FOR AN OXYGEN SENSOR

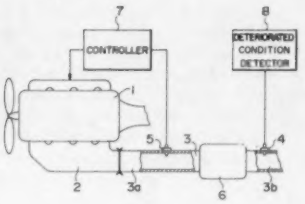
Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Aichi, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 14, 1977, Ser. No. 815,832

Claims priority, application Japan, Aug. 8, 1976, 51-94120

Int. Cl.[2] F02B *75/10, 77/08*

U.S. Cl. 123—198 D **6 Claims**



1. In combination with an engine control system having a catalytic converter mounted in an exhaust passage of the engine, an oxygen sensor mounted upstream of said converter for generating an output signal the signal level of which changes when oxygen concentration present upstream of said converter in said exhaust passage changes across a value corresponding to a stoichiometric ratio of air-fuel mixture supplied to said engine, and a controller connected to said oxygen sensor for feeding back said output signal thereby controlling the oxygen concentration in said exhaust passage towards said value, a sensor deteriorated condition detecting apparatus comprising:

a reference oxygen sensor mounted in said exhaust passage downstream of said catalytic converter and adapted to be correctly responsive to the oxygen concentration present downstream of said converter in said exhaust passage for generating a reference output signal in the same manner as said oxygen sensor connected to said controller;

first comparing means connected to said reference oxygen sensor for generating a first comparison signal which alternately changes between predetermined constant high and low levels in response to changes of said reference output signal;

first integrating means connected to said first comparing means for generating a first integration signal which changes proportionally to the duty factor of said first comparison signal;

second comparing means connected to said first integrating means for generating a second comparison signal when

said first integration signal becomes higher and lower than predetermined upper and lower limits respectively; and

warning means connected to said second comparing means for warning at least of the deteriorated condition of said oxygen sensor connected to said controller in response to said second comparison signal.

4,177,788

DIESEL ENGINE FUEL CONTROL APPARATUS

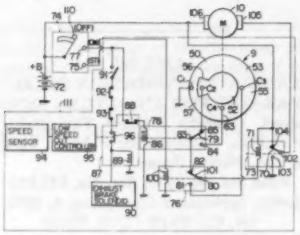
Yoshiyuki Morita, Kariya; Masami Itou, Toyota; Shigeyoshi Nomura, Aichi, and Masahiro Ueda, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kairya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 21, 1978, Ser. No. 935,723

Claims priority, application Japan, Jan. 11, 1978, 53-2256

Int. Cl.[2] F02D *31/00, 1/00*

U.S. Cl. 123—97 B **4 Claims**



1. A diesel engine fuel control apparatus comprising:

a key switch having operational positions including at least a start position for starting a diesel engine, an operation position for continuously running the engine and an interruption position for stopping the engine, said key switch having a start position terminal, an operation position terminal and an interruption position terminal which are selectively connected to one terminal of a vehicle-mounted power supply depending on said key switch being at said start position, said operation position or said interruption position;

an injection pump for controlling the amount of fuel supplied to said diesel engine;

an electrical actuator for driving a control lever means of said injection pump to control the amount of fuel supplied to said diesel engine;

a control unit for controlling the energization of said electrical actuator to increase or decrease the amount of fuel supplied to said diesel engine from said injection pump in accordance with the operational position of said key switch, said control unit including;

a position sensing switching means for sensing the position of said control lever means of said injection pump;

a switchover means adapted to be turned on and off by signals from the start position terminal and the operation position terminal of said key switch, said switchover means being connected to said position sensing switching means and said electrical actuator to drive said electrical actuator to a predetermined position in response to a control signal from said key switch;

a brake responsive switching means for forcibly controlling said switchover means irrespective of the control signal from said operation position terminal of said key switch when an exhaust brake is applied to said diesel engine, for substantially blocking the supply of fuel to said diesel engine from said injection pump;

whereby the operation of said injection pump is controlled by said key switch and an excessive amount of supply of fuel is prevented when the exhaust brake is applied.

4,177,789

METHOD FOR THE PRODUCTION OF SLABS OF MARBLE OR SIMILAR STONY MATERIAL

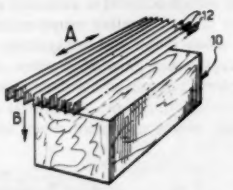
Giuseppe Marocco, Corso Galileo Ferraris 18, Turin, Italy

Filed Aug. 1, 1978, Ser. No. 930,118

Claims priority, application Italy, Aug. 3, 1977, 68796 A/77

Int. Cl.[2] B28D *1/00*

U.S. Cl. 125—1 **30 Claims**



1. Method for the manufacture of slabs by sawing a block of marble, granite or like material by means of a multiple-blade frame, the said method comprising the following steps:

(a) subjecting a monolithic block to a first sawing operation by means of a multiple saw frame to form a series of preliminary slabs parallel to each other,

(b) keeping the preliminary slabs joined together at least at one of their edges to maintain them in fixed relative positions, said preliminary slabs being separated by clefts made by the first sawing operation;

(c) introducing spacer material into the clefts, thus producing a composite block formed by the preliminary slabs and said spacer material, and

(d) subjecting the said composite block to a second sawing operation along intermediate planes of the preliminary slabs, so as to sub-divide each preliminary slab into two final slabs.

4,177,790

POCKET CAMP STOVE

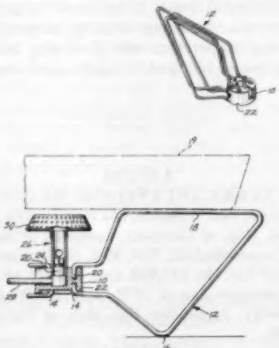
Iwamoto Zenzaburo, Yokohama, Japan, assignor to International Business Development Co., Bellevue, Wash.

Division of Ser. No. 704,119, Jul. 12, 1976, Pat. No. 4,092,974.

This application Dec. 19, 1977, Ser. No. 861,863

Int. Cl.[2] F24C *5/20*

U.S. Cl. 126—38 **4 Claims**



1. A knock-down portable gas stove comprising:

a burner support hub member including a vertical socket;

a plurality of leg members, each of which is pivotally connected to the hub member for pivotal movement about a vertical axis between a use position wherein each of the legs extends radially outwardly from the hub member and

a stowage position wherein each of the leg members are disposed substantially against the other leg members in a relatively flat, juxtaposed relationship;

each of the leg members including a lower foot portion restable on a support surface and an upper pan support portion;

a gas burner unit insertable into the socket in the support hub member and including a burner head positioned above the hub member at a level below the level of the pan supporting portions of the leg members; and

a gas supply conduit having an outlet end connected to the burner unit and an inlet end adapted to receive gaseous fuel from a remote, volumetrically regulated source of gaseous fuel under pressure;

whereby said knock-down portable gas stove can be disassembled for easy, compact stowage in a relatively flat configuration by removing the burner unit from the socket in the hub member, by folding the leg members relatively together, and by placing the burner unit and the gas supply conduit adjacent the folded leg members and the hub member.

4,177,791

WOOD-BURNING STOVES

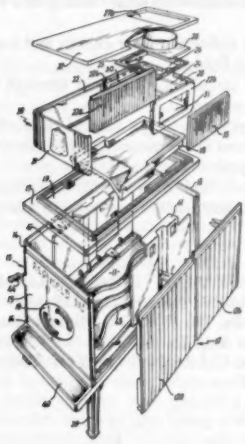
Nicholas G. Marchant, Newbury, England, assignor to Waterford Ironfounders Limited, Bilberry, Ireland

Filed Jan. 17, 1978, Ser. No. 870,062

Claims priority, application United Kingdom, Sep. 6, 1977, 37083/77

Int. Cl.[2] F24B *3/00*; F24C *1/14*

U.S. Cl. 126—65 **6 Claims**



1. A wood-burning stove comprising a combustion chamber defined by a base panel, side panels, rear panel, a front frame, a fire door and ventilator on the front frame, a top frame, and a horizontally disposed baffle plate occupying the rearward region of the top frame to leave an opening forward of said baffle plate for the escape of gases upwardly from the combustion chamber; the stove also comprising a flue chamber above the combustion chamber to accept gases therefrom, said flue chamber being defined by said baffle plate, a front panel, side panels, a rear frame defining a rear flue opening, an upper frame defining an upper flue opening. a liftable and movable hob panel apertured in the region of said upper flue opening, a removable flue outlet collar in one of said flue openings and a removable blanking plate in the other of said openings so that, when said flue outlet collar is in the top flue opening frame, the hob can be lifted and moved independently of the collar to give access for cleaning.

4,177,792

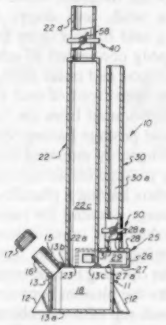
DRILLING RIG HEATER

Clyde E. Finch, Jr., 601 Glendale, Alice, Tex. 78332

Filed Mar. 20, 1978, Ser. No. 890,619

Int. Cl.[2] F24C *5/00*; F23D *5/02*

U.S. Cl. 126—93 **7 Claims**



1. A heater including:

a. a substantially closed first housing forming a fuel and fire reservoir;

b. a first elongated hollow member mounted on top of said first housing with its lower end communicating with said first housing and extending upwardly therefrom;

c. a second housing mounted on top of said first housing, therebeing port means communicating said first and second housing and port means communicating said second housing and said first elongated member;

d. a second elongated hollow member mounted on said second housing and extending upwardly therefrom;

e. said second hollow member having an upper end for communicating air to the interior of said second hollow member, and said second hollow member having its lower end communicating with said second housing for communicating air to said second housing and to said first elongated hollow member;

f. valve means in said first elongated hollow member for controlling communication therethrough; and

g. valve means in said second elongated hollow member for closing off the air supply to said first hollow member and the fuel and fire reservoir.

4,177,793

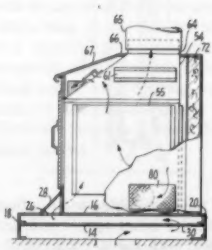
FREESTANDING FIREPLACE STOVE WITH HEATED AIR CIRCULATION

William R. Johnson, Santa Cruz, Calif., assignor to Chinook Manufacturing Co., Santa Cruz, Calif.

Filed Sep. 9, 1977, Ser. No. 831,775

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **1 Claim**



1. A freestanding air circulating fireplace stove comprising, in combination:

a. an all metal uninsulated firebox having two side walls, a back wall and a top wall defining a combustion chamber having an open front,

b. an outer shell completely surrounding said firebox and spaced therefrom to form plenum chambers between the sides, back and top of the firebox, said shell having a back wall including an insulation chamber, and insulation in said chamber so the fireplace stove can be mounted directly against a wall, and doors hingeably mounted thereon covering said firebox open front, said outer shell top being releasably connected to said firebox,

c. a base for said firebox and outer shell, said base extending forwardly of the open front of said firebox and having a passage for combustion air from the base to the open front of the firebox, said passage having an air opening located in front of said hingeably mounted doors, said air opening forming the only passage for air into said firebox from said passage, said firebox having a plurality of openings mating with said air passage opening for receiving air therefrom,

d. a flue for the exhaust of combustion products, said flue being in communication with the top wall of the firebox,

e. a separate air inlet opening in said outer shell for admitting secondary air into the plenum between the outer shell and the sides, back and top of the firebox,

f. exhaust air outlets in the outer shell

g. an electric fan for circulating secondary air through said separate inlet opening, plenum and exhaust outlets,

h. a plurality of Z-shaped stiffeners on said firebox sides and back,

i. a pair of shields each mounted on one of said firebox sides by said stiffeners and spaced from said firebox sides to define air flow channels along said firebox sides, said shields extending only part of the way along said firebox sides to define entrance and exit areas near the top and bottom of said firebox sides respectively so that air from said separate inlet opening flows into said air flow channels to contact said firebox sides, and

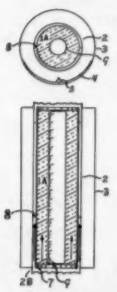
j. a plurality of channel defining means mounted on top of said firebox to receive air from said air flow channels and guide that air along the top of said firebox, said top mounted channel defining means being disposed essentially perpendicularly with respect to said firebox side channels.

4,177,794

EVACUATED-TUBE SOLAR COLLECTOR

Harry E. Novinger, 4961 S. Chester St., Englewood, Colo. 80111

Filed May 5, 1978, Ser. No. 903,068
Int. Cl.² F24J *3/02*
U.S. Cl. 126—443 **12 Claims**



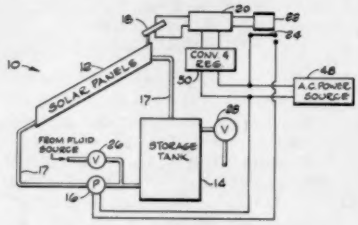
1. In an elongated tube-evacuated solar collector: a collector inner tube and a collector outer tube, the inner tube disposed within the outer tube, both tubes transparent and sealed for evacuation of air in the common space between their walls; a natural dark substantially black mineral wool fibrous absorber with spaces for fluid between its fibers disposed in proximity to substantially all the inner surface of the wall of the inner tube; duct means for venting a fluid transfer agent into the collector, through the absorber and out of the collector; the duct means includes absorber duct means formed by absorber fiber arrangement for venting the transfer agent through the absorber substantially parallel to its axis; and reflector means to re-direct radiation entering the lower evacuated area back to the absorber.

4,177,795

TRIGGERING DEVICE RESPONSIVE TO ENERGY FLOW AND CONTROLLED SOLAR HEATING SYSTEM INCORPORATING THE DEVICE

Robert T. Schultz, 1021 Cliff Dr., Santa Barbara, Calif. 93109

Filed Aug. 11, 1977, Ser. No. 823,572
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **38 Claims**



1. A system for controlled solar heating of a fluid, comprising:

(A) a panel for collecting solar energy and transferring said energy to the fluid;

(B) means for circulating the fluid through said panel to receive said energy;

(C) means responsive to the rate of flow of solar energy through an area in the vicinity of said panel for providing a control signal;

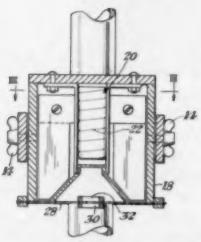
(D) means for switching on and off said circulation of said fluid through said panel in response to said control signal.

4,177,796

MAGNETIC THERMAL VIBRATIONAL DEVICE FOR THE TREATMENT OF ARTHRITIS AND THE LIKE

Jose J. Franco-Vila, 730 E. 6th Pl., Hialeah, Fla. 33010

Filed Aug. 22, 1977, Ser. No. 826,410
Int. Cl.² A61N *1/42*; A61H *23/00*
U.S. Cl. 128—1.5 **3 Claims**



1. A therapeutic device for treating arthritis, rheumatism, or other similarly related bone joint diseases, comprising:

an electromagnet, including a coil, said electromagnet having shaped, spaced apart end faces providing a concentrated field of magnetic energy;

an AC power source connected to said electromagnet for alternately magnetizing said coil;

an elastic supporting band positioned across said spaced apart end faces of said electromagnet;

at least one permanent magnet connected to said elastic supporting band, suspended between the electromagnet end faces, said suspended permanent magnet having its magnetic axis oriented perpendicular to the magnetic field of said electromagnet;

said electromagnet including steel plates coupled together to produce hysterisis;

a housing enclosing said electromagnet for entrapping heat within said housing; and

said elastic supporting band connected at opposite ends to said housing forming a resilient closure for said housing whereby said resilient closure may contact the skin of a patient to produce thermal vibrational effects while an alternating magnetic field is simultaneously disposed therethrough.

4,177,797

ROTARY BIOPSY DEVICE AND METHOD OF USING SAME

Shelby M. Baylis, 6800 Hubbard Rd., Clarkston, Mich. 48016, and Jorge S. Szauer, Pontiac, Mich., assignors to Shelby M. Baylis, Clarkston, Mich.

Filed Mar. 4, 1977, Ser. No. 774,408
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 B **11 Claims**

1. A device for extracting biopsy samples and the like, comprising:

an elongated needle member having distal and proximal ends, said distal end having a sharp conical point for penetration of the body tissue;

said needle member having disposed along at least a portion of the length thereof body tissue helical cutting means;

a hollow cylindrical cutting tube of substantially uniform diameter having distal and proximal ends, said distal end having a truncated conical cutting edge;

said tube being substantially tightly slidably received over said needle member having said helical cutting means disposed thereon, after said needle member has penetrated into the body tissue;

said distal truncated conical cutting edge of said tube projecting beyond said distal sharp conical point of said needle member in the body tissue when said tube is disposed over said needle member in an operative position; and

said needle member and said tube being withdrawn substantially simultaneously from the body with the tissue sample being collected interiorly of said tube

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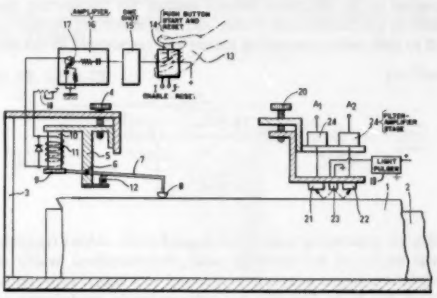
4,177,798

APPARATUS FOR MEASURING THE MECHANICAL CHARACTERISTICS OF A MATERIAL SUCH AS LIVING SKIN

Jean-Luc Lévêque, Montfermeil, and Gilbert Gras, Aulnay Sous Bois, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 7, 1977, Ser. No. 813,458
Claims priority, application France, Jul. 20, 1976, 76 22089
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—774 **15 Claims**

1. Apparatus for measuring certain mechanical characteristics of a material capable of transmitting a vibration, and which can be the skin of a living subject, said apparatus comprising, emitter means for generating a disturbance in the material, and receiver means spaced from said emitter means by a certain distance, the receiver means comprising at least one luminous source associated with two photosensitive receiving cells isolated one from the other, characterized by the fact that the luminous source sends radiation to the surface of the material under test, the photocells receiving the said radiation after reflection from the surface of the material under test, and



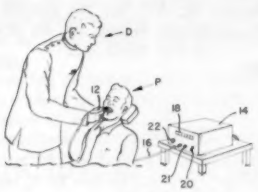
circuit means connected to said photocells for registering characteristics of said material in response to the reflected radiation received by said photocells.

4,177,799

DENTAL PULP TESTER

Carl J. Masreliez, 3301 - 181st Pl. NE., Redmond, Wash. 98052

Filed Jul. 25, 1977, Ser. No. 818,737
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—741 **25 Claims**



1. A system for testing the dental pulp of a tooth, comprising:

a probe having a first electrode adapted to directly contact said tooth;

a second electrode adapted for indirect electrical contact with said tooth;

contact detection means for determining when said first electrode is in contact with said tooth and for generating an initiate signal in response thereto; and

electrical stimulus means connected to said probe for producing an electrical stimulus between said first and second electrodes having an intensity which increases responsive to said initiate signal, said electrical stimulus means further including initializing means for resetting the intensity of said electrical stimulus to a predetermined value responsive to termination of said initiate signal for longer than a predetermined period such that the intensity of said electrical stimulus is initialized to a preset value by removal of said first electrode from said tooth for longer than said predetermined period.

4,177,800

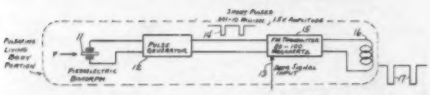
IMPLANTABLE BIOTELEMETRY TRANSMITTER AND METHOD OF USING SAME

Carl C. Enger, 12700 Lake Ave., Lakewood, Ohio 44107

Filed Apr. 10, 1978, Ser. No. 894,811
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2.1 A **9 Claims**

1. A telemetry transmitter adapted to be implanted in a

living body, the transmitter comprising transducer means adapted to be mechanically moved by a pulsating portion of the living body to provide electrical power output; pulse-generating means coupled to said transducer means and responsive to its electrical power output for producing short pulses of predetermined width; radio transmitting means coupled to said pulse-generating means and responsive to the short



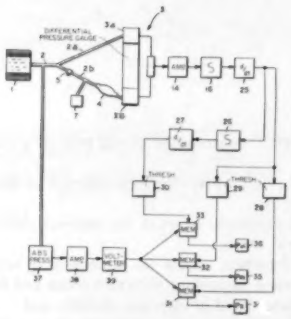
pulses for generating successive spaced radio carrier frequency signal bursts of substantially said predetermined width and modulation means adapted to respond to a signal representing at least one body function for independently modulating said transmitting means, whereby the transmitter transmits during ON times determined by the given width of the pulses and the bursts carry modulation representing the at least one body function.

4,177,801

PROCESS AND APPARATUS FOR THE NON-INTRUSIVE MEASUREMENT OF CIRCULATORY PARAMETERS

Henri Grangirard, Villeurbanne, and Pierre F. Serres, Sainte-Foy-les-Lyon, both of France, assignors to Dubernard Hospital, S.A., Bordeaux, France

Filed Jul. 18, 1977, Ser. No. 816,659
Claims priority, application France, Jul. 30, 1976, 76 24233
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—681 **14 Claims**



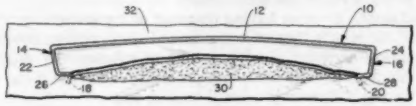
1. A process for the periodical and automatic determination and indication of the systolic and mean pressures of a subject comprising the steps of applying a counter-pressure by a pressure applying means to a part of the body of the subject, varying the counter-pressure from a pressure above the systolic pressure of the subject to a pressure below the diastolic pressure of the subject, converting the shock wave produced by intra-arterial phenomena to an electrical signal by means of an electronic differential pressure gauge having at least one pole thereof coupled to the counter-pressure-applying means so that the intra-arterial phenomena producing variations in the counter-pressure excercised by the counter-pressure applying means are picked up by the electronic differential pressure gauge and converted to an electrical signal having a value which is continuous and proportional to the intra-arterial phenomena, sensing the instantaneous absolute counter-pressure excercised by the counter-pressure-applying means in a continuous manner and converting the instantaneous absolute counter-pressure to a second electrical signal by means of an electronic absolute pressure gauge connected to said pressure-applying means, the second electrical signal being supplied in a continuous manner and having an amplitude which is proportional to the amplitude of the pressure received, obtaining and indicating at the two points characterizing the curve of variation of the value of the electrical signal issuing from the electronic differential pressure gauge as a function of the counter-pressure excercised by the counter-pressure-applying means the two values of the counter-pressure excercised by the counter-pressure applying means which correspond to said two points and which indicate the systolic and mean pressures, wherein the step of obtaining and indicating the data at the two points characterizing the curve of variation of the value of the electrical signal which correspond to the systolic pressure and mean pressure, respectively, includes the step of integrating to "staircase-form" signals of the electrical signal issuing from the electronic differential pressure gauge, the amplitude of the graduations of the "staircase-form" signals being proportional to the difference between the amplitudes of said electrical signal at two successive samples, differentiating said "staircase-form" signals with respect to time in order to give a series of positive electric impulses and a series of negative electric impulses, comparing said impulses with two previously programmed amplitude thresholds in order to identify the two impulses corresponding to said two points, and enabling an electronic member unit to read said second electrical signal representative of said absolute pressure when said impulses have a predetermined relationship to said threshold to thereby determine the systolic and mean pressures.

4,177,802

SELF RETAINING SKIN RETRACTOR

Noboru Ogami, 34 Gartley Pl., Honolulu, Hi. 96817

Filed Dec. 21, 1977, Ser. No. 862,811
Int. Cl.[2] A61B *17/04*
U.S. Cl. 128—20 **5 Claims**



1. A skin retractor for use during suturing of an incision comprising:

an elongated narrow body having a first end and a second end;

a first connecting end attached to said first end, said first connecting end including a first member extending substantially at a right angle from said body a second member extending substantially at a right angle from said first member;

a second connecting end attached to said second end, said second connecting end including a third member extending substantially at a right angle from said body and a fourth member extending substantially at a right angle from said third member;

said first end and said second end to be located at opposite ends of the surgical incision causing slight stretching of the incision resulting in the incision side walls being stretched taut to maintain accurate apposition of the incision side walls to facilitate satisfactory closing of the incision and subsequently the most desirable incision scar in appearance;

a fifth member connected to and extending substantially at a right angle from said second member, said fifth member being positioned substantially perpendicular to said body;

a sixth member extending from and being connected to at substantially a right angle from said fourth member, said sixth member being positioned substantially parallel to said fifth member; and

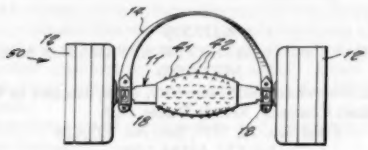
a seventh member connected to and extending angularly outwardly from said fifth member, an eighth member connected to and extending angularly outwardly from said sixth member, in respect to said body the said seventh and eighth members extend in substantially the same direction.

4,177,803

FOOT EXERCISER

Bertha Papistas-Scherer, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 29, 1977, Ser. No. 828,868
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—25 B 4 Claims



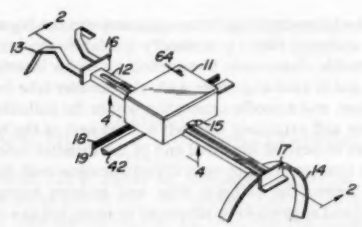
1. A foot exerciser comprising in combination a roller and a strap for securing a person's foot thereupon, said roller comprising a member made of hard material, and including a wheel at each end interconnected by a portion therebetween, and said strap comprising a flexible member looped at each end around said portion and each secured therearound by a buckle.

4,177,804

AUTOMATIC MASSAGING DEVICE

Fred Weingarten, 507 Country Club Dr., Cherry Hill, N.J. 08003

Continuation of Ser. No. 772,771, Feb. 28, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,977
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—52 13 Claims



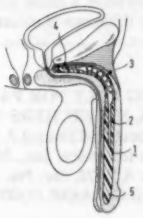
1. An automatic back massaging device, adapted to travel up and down the back of the user, comprising at least one massaging element which engages the back of the user for a combined massaging effect and drive means, means for shoulder and hip engagement, with track structure in between, a housing slidably mounted on said track, said massaging element mounted in said housing, a reversable motor mounted in said housing to drive said device, and automatic switching means adapted to reverse the direction of said device.

4,177,805

PENILE IMPLANTATION PROSTHESIS

Theodor Tudoriu, Munich, Fed. Rep. of Germany, assignor to Peter Falge, Fed. Rep. of Germany, a part interest

Filed Nov. 23, 1977, Ser. No. 854,476
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736443
Int. Cl.[2] A61F *5/42*
U.S. Cl. 128—79 11 Claims



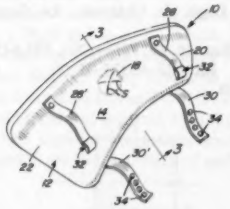
1. A penile implantation prosthesis comprising
an elongated encasing body formed from a physiologically inert and pliable material, and
a stiffening bar completely embedded in said body and extending from the proximal end of said body to a location spaced from the distal end thereof, said stiffening bar being formed from a material more resistant to bending than said body,
said body being dimensioned so that it can be surgically inserted into the corpora cavernosa of a penis with the proximal end anchored near the rami of the pubis and the distal end in approximately the geometric center of the glans penis,
said stiffening bar including a joint portion which is bendable from a substantially straight configuration to a curved configuration in only one direction, said joint portion being located in said body so that, upon implantation, said joint portion resides along the transition area between the rami of the pubis and the base of the penis shaft.

4,177,806

KNEE PILLOW

Teaford A. Griffin, 105 Shearwater Dr., Ocean Springs, Miss. 39564

Filed Nov. 9, 1977, Ser. No. 850,281
Int. Cl.[2] A61F *5/30*
U.S. Cl. 128—132 R 1 Claim



1. A pillow for placement between the knees and adjacent upper and lower leg portions of a person lying on his or her side and having their legs disposed in superposed relation, said pillow comprising an elongated resilient pad of greater length than width and of greater width than thickness, approximate longitudinal and transverse midportions of the opposite sides of said pad defining shallow concave recesses opening outwardly from opposite sides of the pad and registered with each other in the direction in which said thickness is measured, said recesses being adapted to seatingly receive the adjacent portions of said person's knees therein with the adjacent knee portions

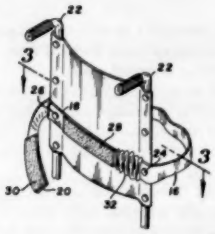
seated in the recesses serving to prevent shifting of the pillow from between the knees and also shifting of the knees from superposed vertically registered positions, the longitudinal extent of said pillow being sufficiently greater than said width to enable the opposite end portions of said elongated pillow to be received between and utilized in maintaining the adjacent upper leg portions and the adjacent lower leg portions of said person comfortably spaced apart, each of said end portions including strap means for adjustable securement about the upper and lower leg portions of one of said legs, said pillow being longitudinally bowed in a plane disposed normal to the direction in which said thickness is measured.

4,177,807

RESTRAINING BELT FOR PATIENTS IN WHEELCHAIRS, STRETCHERS OR THE LIKE

John J. Ocel; Thomas Ocel, and Donald J. Ocel, all of Minneapolis, Minn., assignors to Ocelco, Inc., Minneapolis, Minn.

Filed May 4, 1978, Ser. No. 902,832
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **3 Claims**



1. A restraining strap for securing a patient to a patient-transporting device, comprising:

(a) a unitary, woven, flexible strap having first and second end portions of predetermined lengths;

(b) Velcro-type fastening means attached to the inner and outer surfaces of said strap along said first and second end portions, respectively; and

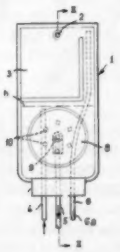
(c) a collapsible, tubular fabric sleeve surrounding said first end portion of said strap and having one end thereof attached to said strap at a point intermediate said first and second end portions and extending a predetermined distance toward the terminus of said first end portion.

4,177,808

ANTI-BUBBLE SAFETY VALVE FOR A LIQUID-CIRCUIT

Edouard Malbec, Logis de Chalonne, Le Gond Pontouvre, France (16160)

Filed Sep. 19, 1977, Ser. No. 834,545
Int. Cl.[2] A61M *05/00*
U.S. Cl. 128—214 R **3 Claims**



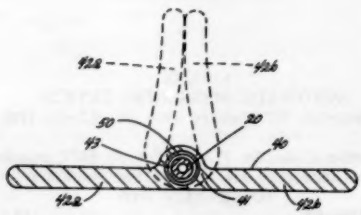
1. An anti-bubble safety device for a low pressure liquid circuit and especially for medical perfusion, comprising a bag including a flexible wall and forming a chamber for the admission of liquid; a valve comprising a diaphragm forming a part of said flexible wall; a seating for said diaphragm formed by a plate having a peripheral edge to which is bonded said diaphragm, said diaphragm and seating forming an interface and comprising at least one liquid circulation passageway through the plate from the interior of the bag to the interface; and an outlet duct extending through said plate which is in laterally spaced relation with said at least one liquid circulation passageway so as to impose a laminar flow of the liquid in the interface between said passageway and said outlet duct, said outlet duct being adapted to be connected to an outlet pipe extending outwardly of the bag and said bag being provided with a passageway to the surrounding atmosphere.

4,177,809

INTRAVENOUS CATHETER APPARATUS AND METHOD

Harvey R. Moorehead, Salt Lake City, Utah, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 15, 1977, Ser. No. 833,628
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 **13 Claims**

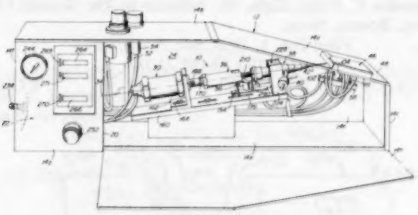


1. An intravenous catheter apparatus comprising an intravenous catheter tube, a manually guidable circumferentially deformable elastomeric bore-defining tubular inserter integral with, and in axial alignment with, the catheter tube for use with a patient, and a needle concentric within the catheter tube and inserter and extending through at least part of the bore of the inserter to beyond the distal end of the catheter tube, the bore of the inserter being in open communication with the catheter tube lumen, the catheter tube and inserter being unitarily joined and adapted to be advanced or retracted as a unit axially in sliding relation along the needle, the inserter comprising opposed laterally extending wings adapted to be manually compressed together from an at-rest position to a needle control position, the bore of the inserter being sufficiently large to permit retraction of the needle from the catheter tube and the inserter when the inserter is at rest, and when the inserter wings are compressed to the needle control position being sufficiently constricted to enable the inserter to grip the needle firmly to permit inserter-forced injection of the distal end of the needle into the body of a patient.

4,177,810
PNEUMATIC INJECTION APPARATUS

Albert J. Gourlandt, Gambais, France, assignor to Damon Corporation, Needham Heights, Mass.

Filed Feb. 24, 1978, Ser. No. 881,033
Claims priority, application France, Dec. 23, 1977, 77 39085
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 A **11 Claims**



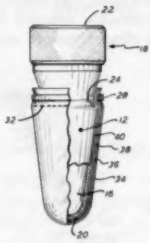
1. An automatic injection apparatus comprising
a fluid actuated drive cylinder having a driven rod extending from one end thereof, said rod translating along a longitudinal axis of said cylinder upon actuation of said cylinder,
a syringe displacement means connected to said rod for movement along the longitudinal axis of the displacement means,
an injection syringe connected to said displacement means and having
a syringe body slidably mounted within a syringe support, and being provided with a lateral injection-liquid supply tubulure,
a syringe piston slidably mounted within the syringe body, and
an injection needle rigidly secured to the syringe body,
fluid logic circuitry including a pneumatic switching means for switchably connecting a system fluid input to said drive cylinder for repetitively driving and releasing said cylinder,
said switching means including at least a start switching means and said cylinder being urged from a withdrawal state to an injection state in response to actuation of said start switching means,
retention means for immobilizing a part of an animal to be treated, said start switching means being housed in said retention means, and said retention means being releasably secured to a top panel surface of said apparatus,
said start switching means being normally in a ready state and being actuated to a start state when said animal part is placed in position at said retention means, and
a release manifold mechanism for connecting said start switching means to other portions of said fluid logic circuitry,
whereby said retention means can be quickly disconnected both mechanically and pneumatically from the rest of said apparatus.

4,177,811
THERAPEUTIC APPLICATOR AND CLEANSING DEVICE

Marcial Alvarez, 225 E. Jersey St., Elizabeth, N.J. 07206

Continuation-in-part of Ser. No. 744,403, Nov. 23, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,070
Int. Cl.[2] A61M *35/00*; B08B *1/00*
U.S. Cl. 128—261 **13 Claims**

1. A cleansing and applicator device for treatment of the perineal area of the human anatomy, comprising in combination:
a generally conically shaped applicator body, said body generally tapering from the base to the apex thereof;
a flexible and compressible covering structure for effecting said cleansing being fitted about and thereby enclosing at least the portion of the said body including said apex; said structure being a composite of overlying layers of material, at least one said layer being moisture-absorbent and another said layer being liquid impervious, the layers of said composite being readily detachable from said structure and thereby from said applicator body by a user of

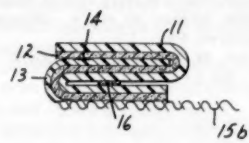


said device to effect disposal of said layers after use thereof; and
means removably securing said covering structure to said applicator body, whereby said covering structure may be replaced following use of the layers thereof.

4,177,812
TAPE STRUCTURE AND GARMENT CLOSURE MADE THEREWITH

Robert C. Brown, Falcon Heights, Minn., and Lyle H. Mickschl, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1973, Ser. No. 389,877
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **5 Claims**



1. In a disposable diaper having a top sheet, a backing sheet and an absorbent core interposed therebetween, a means for providing self-stored protective access to a portion of the adhesive surface of a diaper tape fastener comprising, a pressure-sensitive tape fastener having an upper surface and a lower surface, said lower surface being divided widthwise into two end segments at least one of which is adhesively treated and a middle segment containing a release agent, one of said segments being a fixed end segment which is secured to said backsheet, the other of said end segments being a releasable end segment; said fastener being folded in manner such that said releasable end segment and said middle segment are superimposed over said fixed end segment with the lower surface of said releasable end segment being in contacting relation and releasably secured to the lower surface of said middle segment.

4,177,813
VESSEL OCCLUDER

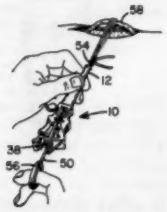
Curtis H Miller, Burnsville; Robert A. Arp, Eden Prairie, both of Minn., and Howard F. Carpenter, South Easton, Mass., assignors to Med General, Inc., Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 868,032
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—326 **9 Claims**

1. A vessel occluder comprising:
(a) an elongated tubular sheath having proximal and distal ends;
(b) a clamp member having a tubular base portion adapted to

be fitted into said proximal end of said tubular sheath and having integrally formed resilient bifurcated fingers extending from said base portion, one of said fingers terminating in an integrally formed, transversely extending clasp segment having an aperture therethrough, said clasp segment being adapted to engage the other of said fingers for releasably pinching said fingers together; and

(c) an elongated retractor adapted to extend through said aperture in said clasp segment, said tubular base portion



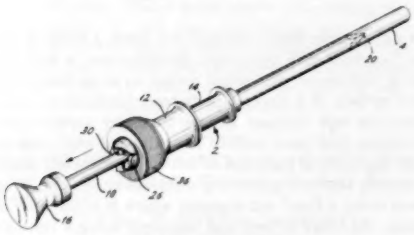
and the lumen of said sheath and beyond both ends thereof, said retractor having a handle at its proximal end and a hook at its distal end adapted to snare the ends of a cord or the like looped about a body vessel and draw said ends through the lumen of the sheath, between said bifurcated fingers and through said aperture in said clasp segment, the arrangement being such that when said clasp segment engages the other of said fingers, said cord is restrained from axial movement with respect to said sheath.

4,177,814

SELF-SEALING CANNULA

William R. Knepshield, Malvern; Jerry Polizzi, Morrisville, and Allen H. Okamoto, Ambler, all of Pa., assignors to KLI, Incorporated, Newtown, Pa.

Filed Jan. 18, 1978, Ser. No. 870,478
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **12 Claims**



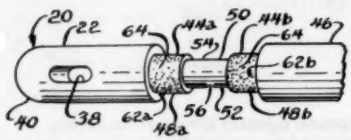
1. A self sealing cannula for insufflatory surgical procedures wherein an operative body cavity is maintained under gas pressure during said surgical procedure, said cannula comprising an elongated sleeve having a cannula passage constructed for receiving surgical instruments therethrough and for penetrating into said operative body cavity to facilitate insertion and withdrawal of a surgical instrument while retaining said cannula in situ and while retaining gas pressure in said body cavity notwithstanding withdrawal of said surgical instrument, said cannula having a valve seat coaxially disposed about the cannula passage through which said surgical instrument is adapted to extend, an elastomeric valve positioned against the valve seat in a position to block said passage, said elastomeric valve having a slotted portion positioned along said cannula passage in a position to be penetrated by said surgical instrument upon insertion thereof, and having sufficient elasticity to yield to permit such insertion, and compression means carried by said cannula and positioned to apply inwardly directed pressure to said elastomeric valve to compress the elastomeric valve inwardly toward said slotted portion thereof for sealing the cannula passage against outward flow of said pressurized gas therethrough after withdrawal of said surgical instrument from said cannula passage.

4,177,815

CATHETER BALLOON STRUCTURE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 1, 1978, Ser. No. 874,072
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **5 Claims**



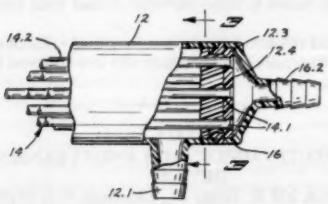
1. A catheter comprising, an elongated shaft having an inflation lumen extending along the shaft, a pair of spaced annular ledges recessed from an outer surface of the shaft circumferentially around the shaft and defining spaced recessed bonding surfaces extending circumferentially around the shaft, and an annular section of the shaft extending between said ledges and recessed from said bonding surfaces circumferentially around the shaft, with said shaft section defining an inner part of a cavity communicating with the inflation lumen intermediate said ledges, said catheter having an annular sleeve of elastic material having a thickness approximately equal to the distance between said bonding surfaces and the outer shaft surface adjacent said ledges, with said sleeve having a length approximately equal to the distance between remote ends of said ledges, and said catheter having means for uniformly bonding opposed ends of said sleeve to said bonding surfaces circumferentially around the ledges.

4,177,816

HEAT EXCHANGER FOR BLOOD

William L. Torgeson, Edina, Minn., assignor to Sci-Med Life Systems, Inc., Minneapolis, Minn.

Filed Mar. 27, 1978, Ser. No. 890,077
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—400 **12 Claims**



1. A disposable heat exchanger for controlling the temperature of blood, comprising a plurality of generally parallel tubes having smooth inner walls, inlet and outlet means for supplying blood to and for collecting blood from the tubes, a jacket about the tubes having inlet and outlet means enabling the flow of a heat exchange medium through the jacket and in heat exchange proximity with the tubes, the tubes being characterized by including elongated inserts therein, each insert having periodic reverse bends providing the insert with a serpentine configuration, outer surfaces of the bends being in heat-

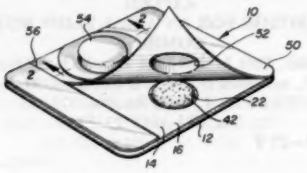
exchange contact with inner walls of the tubes, the tubes with inserts being of sufficient number, length and flow area to enable gentle, laminar blood flow through the tubes at 37° C. at a rate of up to about 5 liters per minute.

4,177,817

DUAL TERMINAL TRANSCUTANEOUS ELECTRODE

Albert J. Bevilacqua, Downers Grove, Ill., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 1, 1978, Ser. No. 874,233
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—802 **4 Claims**



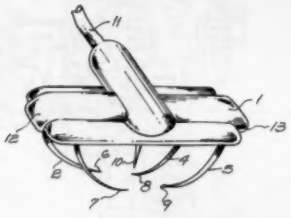
1. A dual terminal electrode construction for the transcutaneous application of current to a patient, such as might be employed in the electrical stimulation of nerves, said electrode comprising a pair of spaced terminal arrangements and a base member upon which said terminal arrangements are provided, said base member comprising a section of nonconductive foam material having an adhesively coated surface for affixing the electrode in engagement with the skin of a patient above the nerve to be stimulated, and a pair of spaced through apertures, a terminal arrangement associated with each said aperture and engaged with the surface of said base member opposite said adhesively coated surface, each said terminal arrangement including, a section of non-porous, adhesively coated material of substantially less area than the base member, and affixed to the base member surface opposite said adhesively coated surface in overlying relation to the associated aperture, said sections of non-porous material serving to define with said apertures, two closed bottom reservoir chambers which open to said adhesively coated surface, with said sections of non-porous material providing the bottom walls for each said reservoir chambers, a terminal member carried by each said section of non-porous material and including a surface portion in said chamber that is sized with respect to said chamber to provide an exposed portion of the adhesively coated surface of said section of non-porous material, an open cell pad disposed in each said chamber in overlying contact with the terminal member, and affixed to the exposed portion of said adhesively coated surface of the section of non-porous material defining the bottom wall of said chamber, said base member being of a thickness to provide reservoir chambers of sufficient depth to accommodate a desired quantity of electrolytic gel which impregnates said pads, and said reservoir chambers being spaced apart a distance sufficient to provide a barrier segment separating one chamber from the other chamber, said barrier segment being of sufficient width at its narrowest point such that upon the mounting of said electrode to the skin of a patient, the respective chambers and the electrolytic gel associated with said chambers are isolated electrically each from the other by said barrier segment, such that upon the application of current across said terminal elements, said current will pass through the skin of the patient.

4,177,818

SELF ATTACHABLE SMALL-TOOTHED ELECTRODE AND A FORCEPS FOR MANEUVERING IT

Francisco L. De Pedro, Segurola 1431, 2nd Floor, Apt. "H", 1638 Vicente Lopez, Argentina

Filed Dec. 5, 1977, Ser. No. 857,845
Claims priority, application Argentina, Dec. 2, 1976, 265699
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—418 **1 Claim**



1. The combination of an electrode carrying member which is adapted to be inserted with hooks into the cardiac muscle and specially shaped forceps to assist in such insertion wherein the improvement comprises:

(a) a substantially parallepipedic elastic body having first and second large planar faces and two parallel long sides and two parallel short sides;

(b) a conductor attached to the first one of the said large faces;

(c) four small inwardly curved teeth attached to the second large face close to the corners thereof;

(d) each tooth having a sharpened thin point;

(e) the teeth next to each of the long sides being arranged in a straight line running parallel to said long sides with the points of opposing pairs of teeth directed towards each other and said opposing pairs of teeth forming an arc of a circle separated by a gap;

(f) a thin electrode point connected to the conductor projecting from the center of the second large face midway between said opposing pairs of teeth;

(g) a stub projecting from each of the short parallel sides of the elastic body;

(h) receptacles at the free ends of said forceps receiving said stubs to permit articulation between the elastic body and said forceps; the arrangement being such that prior to insertion of the electrode the said stubs are placed in said receptacles formed at the ends of the forceps and on manually closing the forceps, the elastic body is bent back on itself until the curved teeth are substantially parallel one with the other and parallel to the electrode point so as to permit their being driven into the heart muscle without tearing the muscle and on releasing the forceps, the elastic body is allowed to resume its original shape causing the curved teeth to be further embedded in the heart muscle with minimum damage to the tissue.

4,177,819

MUSCLE STIMULATING APPARATUS

Harvey I. Kofsky, 3250 Ellendale Ave., Apt. 408, Montreal, Quebec, Canada (H3S 1W4), and Arthur Levine, 5718 Rand Ave., Montreal, Quebec, Canada (H4W 2H7)

Filed Mar. 30, 1978, Ser. No. 891,817
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—422 **3 Claims**

1. Electronic apparatus for stimulating the muscles of a patient, comprising:

electrodes disposed, in operation, on the skin surface of the patient in the vicinity of the muscles to be stimulated;

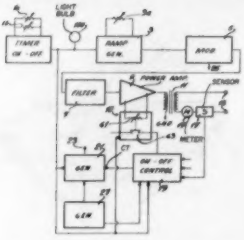
a first generator having an output frequency of 2000 to 3000 Hz;

means for turning said first generator on for a predetermined time period separated by predetermined intervals;

means for gradually increasing the amplitude of said first generator output from zero at the onset of each time period, and for gradually decreasing said amplitude to zero at the end of each time period;

said first generator having a START/STOP terminal;

a second generator, having an output frequency of 40 to 60



Hz, connected to said START/STOP terminal to start and stop said first generator at a rate of 40 to 60 times per second;

whereby to produce, in each of said time periods, 40 to 60 bursts per second of a 2000 to 3000 Hz signal;

filter means receiving said 40 to 60 burst per second of said 2000 to 3000 Hz signal to produce 40 to 60 bursts per second of a low distortion 2000 to 3000 Hz sine wave; and

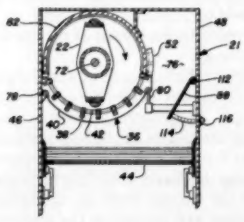
means connecting said sine wave to said electrodes.

4,177,820

COMBINE WITH OFFSET ROTOR

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 7, 1978, Ser. No. 894,323
Int. Cl.[2] A01F *12/20*
U.S. Cl. 130—27 T **4 Claims**



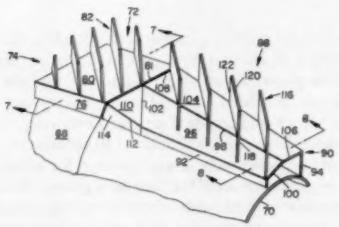
1. A combine for cutting and threshing agricultural products comprising in combination, a mobile frame, a threshing compartment extending longitudinally upon said frame and having an inlet at one end to receive products to be threshed and discharge means at the other end through which waste material is discharged, a single threshing rotor extending longitudinally within said threshing compartment and rotatably supported by axially aligned bearings offset laterally a predetermined distance from the central axis of said compartment to provide a side space laterally between the peripheral path of said rotor and one side of said compartment, a concave supported by said frame longitudinally beneath said rotor and extending segmentally adjacent the lower portion of the peripheral path of said rotor, a separation grate extending coaxially beyond the inner end of said concave and having an upper portion extending upwardly above the corresponding edge of said concave on the side adjacent said space, means extending transversely between the opposite sides of said threshing compartment below said concave to receive threshed material, means to rotate said rotor in a direction to direct the threshed product toward and into said side space in said compartment, a deflector supported at said one side of said compartment and extending downward and inward from one edge adjacent said one side of said compartment and operable to deflect threshed material discharged through said separation grate and concave into said space downward and inward toward the longitudinal center of said material receiving means, and means adjustably supporting the lower edge of said deflector at desired distances toward and from said one side of said compartment to vary the inclination of said deflector to effect substantially evenly desired distribution of said material across said receiving means, whereby substantially even distribution of threshed material occurs on said receiving means between opposite sides thereof.

4,177,821

FEED ROTOR FOR AN AXIAL FLOW ROTARY COMBINE

Rolf W. Peiler, East Moline, and Ronald E. Rohren, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed May 1, 1978, Ser. No. 901,325
Int. Cl.[2] A01F *12/22*
U.S. Cl. 130—27 T **25 Claims**



1. In an axial flow rotary separator for treating agricultural crops in which a rotor rotates within a housing and in which crop material is introduced into an annular space between rotor and housing, rotor and housing cooperating as the rotor rotates to treat the crop material and propel it downstream in a generally spiral path, said separator including a threshing section, an improved separator feed section upstream of the threshing section, comprising:

an infeed housing having a wall including a crop receiving opening and a plurality of helically disposed lead members carried internally by the housing wall; and

a rotor feed portion having a frame, supported for rotation and axially extending in the housing and including a plurality of raised approximately axially extending feed bars carried by the frame, circumferentially spaced and defining between them crop receiving spaces and each having an axially elongated ramp-like surface including, with respect to rotor rotation, leading and trailing portions, said trailing portion being at a greater radial distance from the rotor axis than the leading portion so that crop material introduced to the feed section through the crop receiving opening and entering the crop receiving spaces is engaged by the feed bars and propelled circumferentially, inertia of the material and friction between it and the housing causing relative circumferential motion, the material riding up the ramp and being urged radially outwards and dispersed and forming an attenuated annular mat while engagement by the helical lead members deflects the crop material downstream towards the threshing section.

4,177,822

TOBACCO COMPOSITION

Herman G. Bryant, Jr., Bahama; Vello Norman, Raleigh, and Thomas B. Williams, Durham, all of N.C., assignors to Liggett Group Inc., Durham, N.C.

Continuation-in-part of Ser. No. 548,983, Feb. 11, 1975, abandoned, which is a continuation of Ser. No. 344,589, Mar. 26, 1973, abandoned. This application Jan. 27, 1977, Ser. No. 763,267

Int. Cl.[2] A24B *15/02*

U.S. Cl. 131—17 R 9 Claims

1. A smoking composition comprising tobacco and a water soluble chloride salt of palladium, said salt being decomposable into metallic palladium and associated with said tobacco in said composition in amounts of from about 0.001 to about 0.10 percent by weight, calculated as palladium metal, of said tobacco.

4,177,823

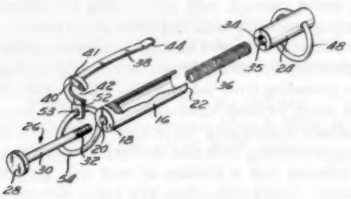
COMBINATION KEY RING

Michael Glasser, 5444 Sepulveda #221, Van Nuys, Calif. 91401

Filed Oct. 6, 1977, Ser. No. 839,827

Int. Cl.[2] A24F *9/02, 9/04*

U.S. Cl. 131—184 R 6 Claims



1. In combination:

An elongated body being substantially hollow having a first end with an opening therein and a second end being substantially closed with a relatively smaller center opening therein, whereby the substantially closed end defining an inner ridge with said body near the second end thereof;

an elongated pin having a first end adapted to be disposed within the center opening in the second end of said body and a second end disposed from center opening outside of said body;

a substantially flat portion being coupled to the second end of said elongated pin and adapted to be disposed outside of the second end of said body;

an inner core member being adapted to be slidably inserted within the first end of said body and coupled to the first end of said elongated pin;

biasing means disposed between the inner ridge in said body and said core member for urging said core member and said elongated pin away from said body and for maintaining said flat portion on said pin against the second end of said body whereby pressure exerted against said core member forces said flat portion on said pin away from said body and defines a space therebetween;

an end clip having a relatively thin, flat member with a slot therein adapted to be placed between said flat portion and the first end of said body whereby said pin is fitted into said slot; and

an elongated flat member coupled to said thin, flat member at a right angle thereto, whereby said end clip can be removed when said core member is depressed into said body.

4,177,824

DEVICE FOR AUTOMATIC HAIR CURLING

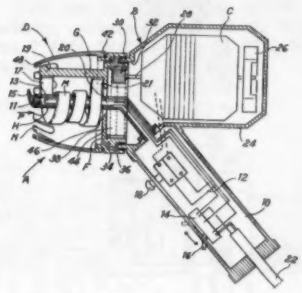
Vittorio Gnaga, Via Boccaccio 4, Milan, Italy

Filed Dec. 7, 1977, Ser. No. 858,377

Claims priority, application Italy, Dec. 20, 1976, 30639 A/76

Int. Cl.[2] A45D *2/12*

U.S. Cl. 132—34 R 9 Claims



1. A device for automatically curling hair, said device comprising:

a dome-shaped housing having an inlet opening and a longitudinal axis;

a fixed rod immovably positioned coaxially within said housing;

heating means immovably positioned within said fixed rod;

a driving rod positioned within said housing at a position spaced radially outwardly from said fixed rod;

a spiral-shaped tape-like member positioned within said housing and eccentrically about said fixed rod, said spiral-shaped member having at least one end fixed to said driving rod; and

driving means, operatively connected to said driving rod, for moving said driving rod in a path coaxially about said fixed rod, and for thus rotating said spiral-shaped member eccentrically about said fixed rod, thereby creating a suction through said inlet opening, such that the combined action of said rotating spiral-shaped member and said suction operates to wind a lock of hair, introduced into said housing through said inlet opening, around said fixed rod.

4,177,825

SELF-GRINDING VALVE MECHANISM

Millard B. Crawford, Baton Rouge, La., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

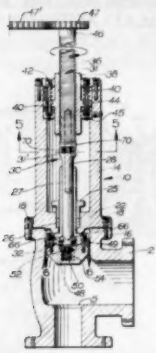
Filed Dec. 5, 1977, Ser. No. 857,644

Int. Cl.[2] B24B *15/02*

U.S. Cl. 137—243.2 8 Claims

1. In a self-grinding valve mechanism of the type described, the combination of a valve body provided with a valve seat, a valve disc adapted to contact said valve seat upon the closing of the valve mechanism said valve disc being operative during selective contact with the said valve seat to effect a grinding of said seat, means including a valve stem assembly for operating said valve disc to open and close the valve mechanism and to selectively grind said valve seat, means for rotating said valve stem assembly and displacing said valve stem assembly relative to said valve seat, means for floatingly coupling said valve stem assembly to said valve disc to effect a controlled rotation of the valve disc during the grinding of the valve seat including cooperating key and keyway means and means for activating said coupling means including means biasing said key means in the keyway means said biasing means being loaded upon the valve disc engaging said valve seat, whereby upon activation of said coupling means a simultaneous rotation of the valve stem assembly and disc will take place and a grinding of the

valve seat effected and wherein said valve stem assembly is segmented and the cooperating opposed portions thereof are provided with coupling lugs selectively spaced with respect to



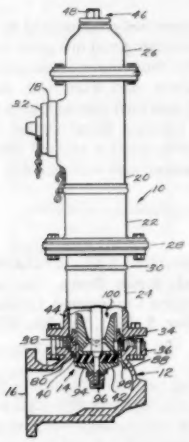
each other so as to provide a delayed coupling and linear displacement of the valve stem segments and relieving the force of said biasing means prior to rotation of the valve disc upon the initial rotation of one of said valve stem segments.

4,177,826

FIRE HYDRANT WITH IMPROVED SHOE AND VALVE

Lawrence F. Luckenbill, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Jan. 26, 1977, Ser. No. 762,511
Int. Cl.[2] E03B 9/08
U.S. Cl. 137—307 **22 Claims**



1. A fire hydrant comprising:

a barrel closed at its upper end and open at its lower end, said barrel having at least one outlet nozzle adjacent its upper end;

an elbow shaped hydrant shoe having one end with an upwardly opening mouth, said one end being attached to the lower end of said barrel, and another end with an inlet opening lying in a plane substantially 90° to a plane of the upwardly opening mouth, said other end being arranged to be attached to a water main;

a downwardly facing valve seat ring positioned in the one end of said shoe adjacent the upwardly opening mouth;

a valve element arranged to seat on said valve seat ring;

a reciprocating valve stem extending from said valve element upwardly within said barrel; and

operating means connected to said valve stem and extending out of the closed end of said barrel,

the improvement in interior configuration of said shoe and in exterior configuration of said valve element for minimizing flow loss of the hydrant between the inlet opening of said shoe and the outlet nozzle of said barrel, said improvement comprising said shoe having a cylindrical inlet passage extending from said inlet opening and a cylindrical outlet passage extending from said upwardly opening mouth, a part spherical chamber communicating with said cylindrical inlet passage and said cylindrical outlet passage, said part spherical chamber having a spherical center positioned above the axis of said cylindrical inlet passage and on the axis of said cylindrical outlet passage, a diverging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical inlet passage and said diverging transitional surface of rotation extending from a plane perpendicular to the cylindrical inlet passage and smoothly merging with said part spherical chamber at a tangential intersection with the same, a converging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical outlet passage, said converging transitional surface of rotation extending smoothly from a tangential intersection with said part spherical chamber to a plane extending perpendicularly to an axis of said cylindrical outlet passage, said converging transitional surface merging smoothly with said diverging transitional surface, and said valve element having on its upper surface thereof a generally conically shaped converging surface of rotation extending from substantially a maximum diameter of said valve element substantially to said valve stem, said generally converging surface of rotation of said valve element defining with said converging transitional surface of rotation and a portion of said diverging surface of rotation of said shoe when said valve element is open an annular passage for uniform flow fluid through said shoe and into said barrel, said annular passage varying in radial section from a diverging radial section at a midpoint of said converging transitional surface of rotation of said shoe to a converging radial section at a midpoint of said diverging transitional surface of rotation of said shoe.

4,177,827

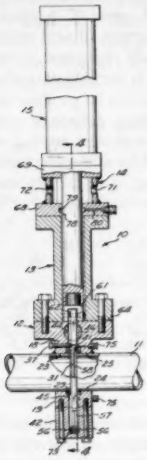
PIPE PLUGGING DEVICE

Joseph B. Smith, Berea; Edward B. Smith, Cleveland Heights; Gregory D. Schroeder, and William B. Smith, both of Berea, all of Ohio, assignors to The Pipe Line Development Co., Cleveland, Ohio

Filed Oct. 5, 1977, Ser. No. 839,608
Int. Cl.[2] F16K 43/00
U.S. Cl. 137—318 **18 Claims**

1. Apparatus for controlling flow through a pipeline or other conduit carrying fluid, comprising a fluidtight housing adapted to be secured around the exterior of a pipeline in a location intermediate its ends, said housing including walls defining a cavity around said pipeline, a shear adapted to operate in said cavity, a shear driving means supported on said housing and connected to said shear for driving said shear transversely through the pipeline, and shear actuator means for moving a shearing surface associated with said shear formed by a face of said shear transverse to an axis parallel to the pipeline axially into engagement with a sealing surface formed in the interior of the housing opposite said actuator means, said sealing surface encircling the interior of the pipeline concentric with and transverse to the pipeline whereby said shear is effective to terminate flow though the pipeline, said housing walls including a wall generally transverse to said pipeline and opposing

said encircling sealing surface, said actuator means being carried on said transverse wall of said housing, said actuator



means being operable independently of the operation of said shear driving actuator.

4,177,828

TAPPING OF GAS FROM A CARTRIDGE

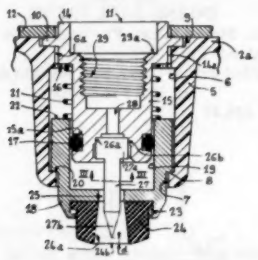
Marcel Vache, Sainte-Foy-Les-Lyon, France, assignor to Application des Gaz, Paris, France

Filed Mar. 6, 1978, Ser. No. 883,962

Claims priority, application France, Mar. 8, 1978, 78 07739

Int. Cl.[2] F16K *43/00;* B67B *7/24*

U.S. Cl. 137—318 **11 Claims**



1. A tapping device for use in a gas appliance for tapping gas from a puncturable and disposable gas cartridge, comprising:

a body having an axially elongated outer surface, having an appliance receiving socket at one end and having an axial channel extending from the socket through the body;

a perforating needle fixed to the body in alignment with the axial channel and extending beyond the other end of the body and operative to puncture a cartridge when the body is moved axially to drive the needle thereinto;

a ring surrounding the body with a functional clearance enabling axial sliding of said ring over and outside said body;

spring means operative between the ring and the body to resiliently urge the ring toward said other end of the body; and

annular sealing means carried by the ring, the sealing means surrounding the perforating needle and being normally urged by the spring means beyond the needle, the sealing means being operative to seal against the cartridge under the pressure of the spring means when the perforating needle is driven into the cartridge.

4,177,829

FLOAT CONTROLLED VALVES

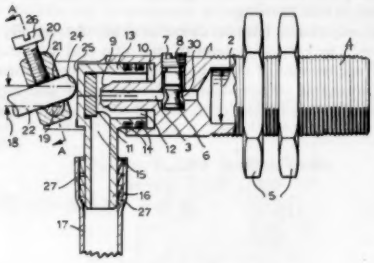
David Friedman, 91 Frere Rd., Judith's Paarl, Johannesburg 2001, South Africa

Filed Apr. 13, 1977, Ser. No. 787,297

Claims priority, application South Africa, May 10, 1976, 76/2758; Jun. 7, 1976, 76/3361; Aug. 10, 1976, 76/4784; Nov. 25, 1976, 76/7064; Feb. 23, 1977, 77/1067

Int. Cl. F16k *31/26*

U.S. Cl. 137—426 **3 Claims**



1. A float controlled valve including a float, a first body having a passage passing through it, means at the outlet end of the passage defining a valve seat, a cooperating second body having a loose closure element, the first body and second body being telescopically engageable with and movable relative to each other whilst being in sealing contact to define a chamber including the valve seat and the closure member, an outlet from said chamber being provided in the second body, and means for moving the second body and closure element telescopically relative to the first body and valve seat to cause closing of the valve, the means for moving the second body comprising a pivotal mounting fixed to the first body and adapted to mount the float, said closure element being free to move onto the valve seat in the event there is a reverse pressure gradient between said outlet and said passage, the pivotal mounting comprising a pivotally mounted member which is perforated by at least three mutually orthogonally oriented and intersecting holes, a pivot pin disposed in a first one of the holes, a float arm associated with the float and disposed in a second one of the holes and a threaded member disposed in the third one of the holes, the pivot pin having a recessed area with which the float arm is in contact, the threaded member acting to lock the float arm in an axially adjusted position in the second hole and to lock the pivot pin in position in the first hole by reason of contact of the float arm with the pivot pin, the second hole being eccentric with respect to the first hole, the float arm projecting from the pivotally mounted member and located for engagement with the second body to urge it toward a closed condition as the pivotally mounted member is rotated by rising of the float.

4,177,830

VALVE ASSEMBLY PERMITTING INDEPENDENT PEAK FLOW AND DECAY RATE CONTROL OF PERIODIC GAS FLOWS

Ramon J. Munson, Rialto, Calif., assignor to Bourns, Inc., Riverside, Calif.

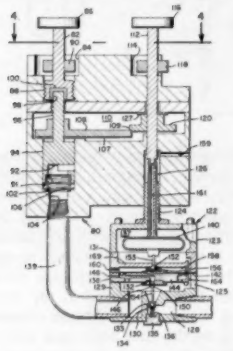
Filed Dec. 21, 1976, Ser. No. 752,945

Int. Cl.[2] F16K *31/12;* A62B *7/00*

U.S. Cl. 137—501 **10 Claims**

1. Apparatus for controlling the peak flow rates and decay rates of periodic gas flows through a conduit, the peak flow rates being characterized by an initial minimum pressure followed by a progressively increasing pressure, comprising:

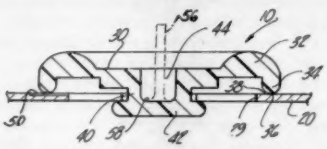
a housing for retaining elements of said apparatus;
an adjustable peak flow valve in said housing having an adjustable orifice for restricting the flow of gas through said conduit, said adjustable peak flow valve comprising
a cylindrical aperture in said housing for retaining the elements;
a hollow cylindrical member slideably situated within said aperture;
an axially extending shaft formed integrally with one end of said hollow cylindrical member;
an annular step forming an axial shelf at the other end of said hollow cylindrical member;
a first port formed in a side wall of said hollow, cylindrical member;
a second port, capable of alignment with said first port, formed in said housing;
means to adjust said hollow, cylindrical member axially and rotatably to vary alignment of said first and said second ports; adjustment of said alignment of said ports forming said adjustable orifice;—and—adjustment of said adjustable orifice controlling peak flow through said conduit



an adjustable decay rate valve in said housing having a regulator controlled by means of adjustments made to said adjustable decay rate valve, said regulator having means for receiving a supply of gas under pressure from an inlet port, said regulator means including means for sensing pressure at said peak flow valve, means for regulating said gas in response to the pressure at said peak flow valve adjustable orifice, and conduit means for supplying the regulated gas to said adjustable peak flow valve;
means responsive to the adjustment of said adjustable peak flow valve for effecting adjustment of said adjustable decay rate valve;
whereby said responsive adjustment means is responsive to adjustment of said adjustable decay rate valve for effecting the adjustment of said peak flow valve so as to automatically adjust the size of said orifice by an amount sufficient to substantially compensate for changes in the peak flow rate resulting from the adjustment of said adjustable decay rate valve.

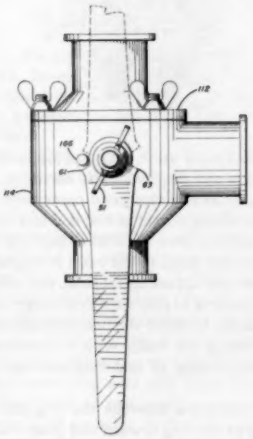
4,177,831
FLEXIBLE TIME DELAY VALVE
Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.
Filed Aug. 25, 1977, Ser. No. 827,456
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—513.5 **2 Claims**

1. A time delay valve for controlling fluid communication through an opening in a wall and allowing communication from one side of said wall to the other but restricting flow in the opposite direction, the combination comprising; a body of resilient material having a disc shaped head adapted to be disposed at one side of said wall, said opening have a central portion and diametrically opposed elongated portions extending radially from said central portion, said head being larger in diameter than said opening and disposed in engagement with said wall to close said opening, a central stem protruding through said central portion of said opening and permitting fluid passage through said elongated portions of said opening, a disc shaped stop portion forming part of said stem and having a continuous annular portion larger than said central portion of said opening and requiring deflection upon insertion of said valve in said opening, said stem having an axially extending recess closed at one end by said stop portion, said valve being insertable in said opening upon the application of force in said recess and on said stem to push said valve through said opening



from one side of said wall, said recess and said elongated portions accommodating displaced material of said valve during its insertion in said wall, said head having an annular bead formed at the circumferential edge of said head to form a sealing surface, said sealing surface having a semi-circular cross section forming a relatively narrow sealing surface and being engageable with a complementary flat sealing surface on said wall, a metering groove in said wall extending radially from said opening beyond said bead, said head being flexible and movable out of engagement with said wall surface to permit fluid flow in one direction through said opening and being engageable with said wall to limit fluid flow through said metering groove and said opening in the opposite direction.

4,177,832
INLINE BALL VALVE
Lewis H. Price, State College, Pa., assignor to Lee Industries, Inc., Philipsburg, Pa.
Filed Jul. 11, 1977, Ser. No. 814,681
Int. Cl.[2] F16K *5/06*
U.S. Cl. 137—625.47 **7 Claims**



1. A three way ball valve comprising:
a valve body having a pair of axially aligned ports and a third port extending perpendicular to the pair of axially aligned ports;

a ball, with a passage having three openings formed therein, positionable with respect to the valve body so that the three openings are aligned with the three ports;

a cage formed of a plastic material, confined in the valve body around the ball with openings aligned with the ports in the valve body and being in high pressure contact with the ball in an area proximate to the pair of axially aligned ports;

an operating stem for the ball extending radially therefrom through a radial opening in the cage and through a corresponding radial opening in the valve body;

a handle connected to said operating stem exteriorally of said valve body for rotating said operating stem to position said ball, said handle having a pair of spaced projections with oppositely arranged engaging surfaces; and,

stop means comprising at least one upstanding element, disposed on the exterior of said valve body for contacting said engaging surfaces of said projections on said handle to limit rotation of said handle;

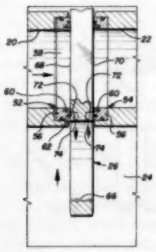
said handle being formed so that when said stop means is positioned between the closest adjacent engaging surfaces of said projections, rotation is limited to 90°, and when said stop means is positioned between the other of said engaging surfaces of said projections, rotation is limited to 180°.

4,177,833

VALVES HAVING A PRESSURE EQUALIZER ACROSS DUAL FACE SEALS

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,775
Int. Cl.² F16K *11/07*
U.S. Cl. 137—625.12 **10 Claims**



1. A valve structure comprising:

a valve body having a flow passage therethrough and a valve chamber therein intersecting the flow passage, a valve member mounted within the valve body for movement between open and closed positions and having a main bore therethrough adapted to align with the flow passage in the open position;

an annular upstream seat assembly on one side of the valve member about the inlet to the valve chamber and an annular downstream seat assembly on the other side of the valve member about the outlet from the valve chamber, said seat assemblies each having a pair of spaced concentric face seals adapted to engage against the exterior sealing surfaces of the valve member;

said valve member having at least a pair of cooperating auxiliary pressure relieving passageways adjacent opposite ends of the bore extending from the bore through the valve member to the exterior sealing surface thereof adjacent the leading side of the valve member as the valve member is moved from closed position to open position, one of the auxiliary passageways being an upstream auxiliary passageway positioned adjacent the upstream seat assembly and the other auxiliary passageway being a downstream auxiliary passageway positioned adjacent the downstream seat assembly in the closed position of the valve member;

said valve member during initial movement from closed position to open position temporarily positioning the auxiliary passageways between the concentric face seals of the respective associated adjacent seat assemblies permitting fluid to pass from the inlet by leaking past the inner face seal of said upstream seat assembly through the upstream auxiliary passageway into the bore, and then passing from the bore into the downstream auxiliary passageway and leaking past the inner face seal of said downstream seat assembly into the outlet;

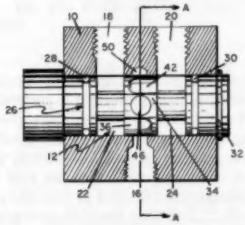
said auxiliary passageways and said face seals being effective to reduce the overall pressure differential between the upstream and downstream seat assemblies when said valve member is initially moved from the closed position.

4,177,834

ROTARY FOUR WAY TANDEM CENTER VALVE

Roland W. Bonney, R.F.D. 1, Box 65, Kennebunkport, Me. 04046

Filed Feb. 5, 1979, Ser. No. 9,485
Int. Cl.² F16K *11/07*
U.S. Cl. 137—625.23 **3 Claims**



1. A rotary four way tandem center valve comprising:

a valve housing;

a cylindrical bore defined in said valve housing;

an inlet port defined in said valve housing communicating into said cylindrical bore adapted to allow the entrance of hydraulic fluid into said cylindrical bore;

an outlet port defined in said valve housing communicating into said cylindrical bore adapted to allow the escape of hydraulic fluid from said cylindrical bore;

a first and second operation port defined in said valve housing, each communicating into said cylindrical bore;

a spool member rotatably positioned within said cylindrical bore;

a spool projection member extending around and projecting from said spool member, adapted so that its outer periphery contacts said valve housing within said cylindrical bore;

a first and second pressure chamber defined within said cylindrical bore, one on each side of said central spool projection member into which said first and second operation ports communicate respectively;

a first and second axial groove defined opposite one another on the periphery of said central spool projection member, each extending toward and communicating with said first pressure chamber;

a third and fourth axial groove defined on the periphery of said central spool projection member, each positioned opposite one another, each extending toward and communicating with said second pressure chamber, said first, second, third, and fourth grooves adapted such that when said first groove is aligned with said inlet port, said third groove is aligned with said outlet port and when said second groove is aligned with said outlet port, said third groove is aligned with said inlet port; and

a first and second channel intersecting one another defined

within said central spool projection member, adapted such that when said first channel is rotated to be in communication with said inlet port, said second channel is in communication with said outlet port.

4,177,835

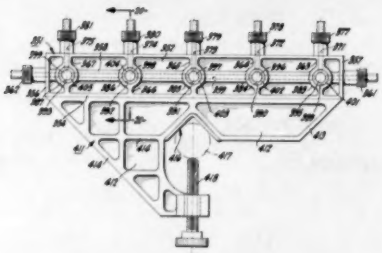
PLASTIC MANIFOLD ASSEMBLY

Hyman W. Paley, 20 Broadmoor Dr., San Francisco, Calif. 94132

Continuation of Ser. No. 579,906, May 22, 1975, abandoned, and a continuation-in-part of Ser. No. 538,936, Jan. 6, 1975, abandoned. This application Sep. 29, 1976, Ser. No. 727,791

Int. Cl.[2] E03B *7/07*

U.S. Cl. 137—883 **10 Claims**



1. In a manifold assembly: a generally rectangular body fabricated of molded plastic including a generally planar top wall, end and side walls extending from the top wall, a longitudinal rib adjoining the top wall and extending between the end walls in a direction generally parallel to the side walls, a plurality of lateral ribs extending between the side walls, axially extending flow passageways formed in ribs, the passageway in the longitudinal rib intersecting the passageways in the lateral ribs, valve bores formed in the body at the intersections of the passageways extending in a direction normal to the passageways, and valve members rotatively mounted in the bores having passageways adapted for selective alighment with the intersecting passageways for controlling communication between the same.

4,177,836

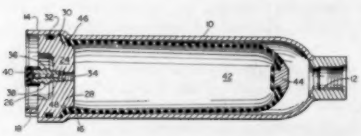
DISPOSABLE PRESSURE VESSEL

James E. Thompson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 23, 1978, Ser. No. 953,692

Int. Cl.[2] F16L *55/04*

U.S. Cl. 138—30 **4 Claims**



1. A pressure vessel comprising: a cylindrical cap member having an axially extending through hole provided therein, said cylindrical cap member having an exteriorly disposed annular shoulder provided therein around the periphery thereof; a normally closed gas valve disposed in blocking position in said through hole openable to allow bidirectional flow of gas through said through hole; a generally cylindrical bladder of a resilient deformable material having a closed end and an open end, said open end having an annular flared portion bonded to said exteriorly disposed annular shoulder of said cylindrical cap member which blocks said open end of said generally cylindrical bladder; and a rigidly cylindrical housing having a closed end and an open end, said closed end having a port provided therein and said open end having an interiorly disposed annular shoulder portion provided therein around the periphery thereof, said housing sized to contain said generally cylindrical bladder and said cylindrical cap member therein with said annular flared portion of said generally cylindrical bladder abutting said interiorly disposed annular shoulder portion of said cylindrical housing and with said cylindrical cap member blocking said open end to enclose said generally cylindrical bladder in said cylindrical housing, said interiorly disposed annular shoulder portion of said cylindrical housing including at least one interiorly offset lanced portion positioned to hold said cylindrical cap member in juxtaposition compressing said flared portion of said generally cylindrical bladder between said interiorly disposed annular shoulder of said cylindrical housing and said exteriorly disposed annular shoulder of said cylindrical cap member.

4,177,837

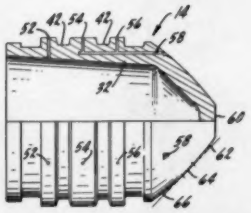
ACCUMULATOR

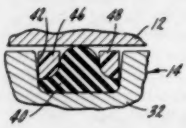
Earl E. Frank, Tallman, N.Y., and Bing S. Yee, Paramus, N.J., assignors to Abex Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,319

Int. Cl.[2] F16L *55/04*

U.S. Cl. 138—31 **3 Claims**



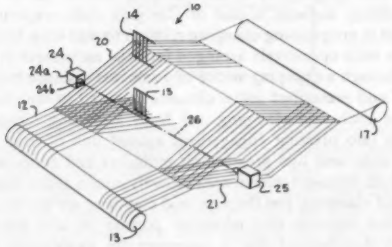


1. In an accumulator comprising a cylinder having a delivery port at one end for delivering hydraulic fluid under pressure and having an opening at the opposite end enabling a pressurizing gas to be admitted to the cylinder, a piston having a cylindrical side wall complementally fitting the inside diameter of the cylinder and having an end wall, facing the delivery port, comprising two spherical zones having substantially the same radius separated by a chordal surface having no radius surface, and the cylinder having a concave end wall, at the delivery end of the cylinder, with a slope substantially complemental to said chordal surface and constituting complemental stop for said surface of the piston, said spherical zones serving to sweep dirt past said concave end wall and out the delivery port.

4,177,838
STOP MOTION SYSTEM FOR HIGH SPEED LOOMS AND THE LIKE

Marlin Van Wilson, Barboursville, Va.; Larry C. Nickell, Lewisburg, and John L. McCormack, Fairlea, both of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Apr. 6, 1978, Ser. No. 893,931
Int. Cl.[2] D03D *51/28;* G01N *21/28*
U.S. Cl. 139—353 22 Claims



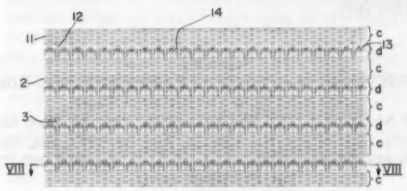
1. Automatic loom stopping apparatus to be associated with a loom wherein warp yarns are shedded periodically to open shed condition during weaving for detecting yarn defects arising from warp yarn breakage or improper shedding and actuate loom stop motion means of the loom upon occurrence of such yarn defects, comprising monitor light beam forming means including light beam emitter and detector means positioned adjacent the warp yarn path from the supply end to the weaving zone of the loom to direct the monitor light beam through the open shed along a substantially horizontal transverse light path generally perpendicular to the warp yarns, the detector means providing a detector defect signal when any portion of a warp yarn or broken end interrupts the monitor light beam, signal processing means including amplifier means for producing a processed defect signal responsive to said detector defect signal, timing pulse forming means including rotation sensing means monitoring rotation of a drive shaft of the loom for producing timing pulses indicating a predetermined phase time in the cycle of operation of the loom, a gate control pulse generator for producing short duration window pulses responsive to said timing pulses to indicate times when the shed is in predetermined open condition, a first gate circuit receiving said processed defect signals and said window pulses for producing a first gated defect signal when said yarn defects occur during the open shed periods signified by the window pulses, start-up delay signal means responsive to said timing pulses for producing a gate enable signal commencing at a delay time following loom start-up when the timing pulses occur at a predetermined frequency, a second gate circuit responsive to concurrence of said gate enable signals and said first gated defect signals to produce output stop signals, and stop relay means activated by said output stop signals to stop the loom.

4,177,839
WEBBING FOR SEAT BELT

Kouichi Kikuchi, Haibara, Japan, assignor to NSK-Warner K.K. and Kikuchi Kogyo K. K., both of Tokyo, Japan

Division of Ser. No. 781,433, Mar. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,771, Jan. 27, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,587
Int. Cl.[2] D03D *15/00*
U.S. Cl. 139—419 1 Claim

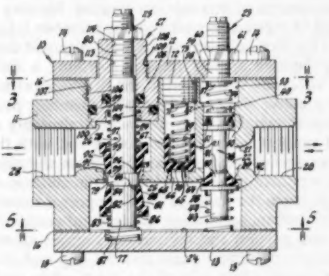
1. An energy-absorbing webbing for seat belts comprising wefts of high extensibility, first warps of high extensibility, second warps which are thin as compared with the first warps and have low extensibility, the second warps being interwoven in the webbing in widthwise spaced relationship, and third warps selected from threads of low and medium extensibility and interwoven in the webbing, the third warps being undulated in the widthwise direction of the webbing to form with the second warps a Leno weave construction.



4,177,840
PRESSURE REGULATION AND FLOW CONTROL VALVE WITH COMBINATION NEEDLE AND CHECK VALVES

James A. Neff, Bloomfield Township, Oakland County, and Richard A. Fagerlie, Union Lake, both of Mich., assignors to MAC Valves, Inc., Wixom, Mich.

Filed Dec. 29, 1977, Ser. No. 865,390
Int. Cl.[2] F15B *11/04, 13/042*
U.S. Cl. 137—599 15 Claims



1. In a combination pressure regulating and flow control air valve for controlling fluid flow through a fluid flow circuit which includes a fluid controlled apparatus, the combination comprising:

(a) a valve body and cover means having an upstream pressurized fluid supply port for connection to a source of pressurized fluid, and a downstream working port for connection to the fluid controlled apparatus in said fluid flow circuit, and a fluid flow passage interconnecting said ports;

(b) an adjustable pressure regulator valve means operatively mounted in said fluid flow passage to provide a regulated downstream pressure at the downstream working port when fluid is flowing from the source of pressurized fluid into the upstream port and to the downstream port;

(c) a check valve means operatively mounted in said fluid flow passage in parallel with the pressure regulator valve means and operative to force the flow of fluid through said pressure regulator valve means when fluid is flowing through said fluid flow passage from said upstream port to said downstream port, and allow flow past said pressure regulator valve means and reduce pressure in said fluid flow passage to allow the pressure regulator valve to open when fluid is exhausted from said downstream port and through said fluid flow passage and out the upstream pressure port; and,

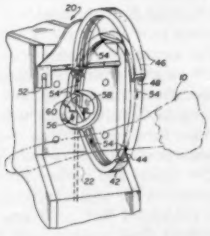
(d) an adjustable, double acting, fluid flow control valve means operatively mounted in said fluid flow passage downstream from said adjustable pressure regulator valve

means, and in series with said check valve means to provide a selective metering action to the flow of fluid through said fluid flow passage from either port to the other port.

4,177,841
HANGER FOR SUPPORTING PANTS AND THE LIKE AND METHOD OF PRODUCTION
Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409
Continuation of Ser. No. 829,231, Aug. 31, 1977, Pat. No. 4,120,433. This application Oct. 11, 1978, Ser. No. 950,370
Int. Cl.[2] B21F *45/02*
U.S. Cl. 140—81.5 **6 Claims**

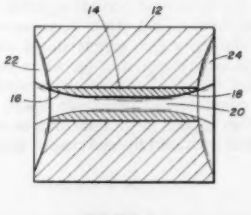
1. A method of producing a hanger for supporting pants from a clothes rod, comprising the steps of forming a generally horizontal elongated first support member, forming a generally horizontal elongated second support member integrally connected to the first support member and disposed thereabove in generally parallel spaced relation, forming a third support member integrally connected to the first support member and projecting above the second support member, providing the third support member with means for releasably connecting the third support member to a clothes rod with the first and second support members depending from the third support member, supporting the second support member in a cantilever manner between the first and third support members and with a free end portion, positioning the free end portion for guiding the free end portion and the second support member on one side of inverted vertical pants and the first and third support members on the other side of the pants when said hanger is inverted and slid laterally onto the pants, and maintaining the vertical spacing between the first and second support members sufficiently to avoid clamping the pants therebetween when the inverted hanger is slid laterally onto the pants to facilitate convenient and quick attachment of the hanger to the pants.

4,177,842
TYING MACHINE
Gerald G. Dilley, Portland, Oreg., assignor to Peters Equipment Corporation, College Point, N.Y.
Filed Jan. 25, 1978, Ser. No. 872,013
Int. Cl.[2] B21F *7/00, 15/04*
U.S. Cl. 140—93.6 **4 Claims**



1. An improved pair of wire-engaging clamps for a wire twisting machine of the type wherein a wire length is urged through movement into encircling relation about a product and the opposite ends of said wire length are then clamped and said clamped wire ends then rotated so as to produce twists in the portions of said wire lengths adjacent said ends for tying said wire lengths about said product, said pair of clamps comprising a cylindrical body journalled for rotation and having a wire-clamping station formed on one end thereof, a pair of circumferentially spaced wire-holding surfaces operatively arranged on said body in clearance positions of a prescribed initial distance from said cylindrical body wire-clamping end so as to allow the positioning in said clearances of said wire length ends preparatory to the clamping thereof against said wire-holding surfaces, a pair of clamping rods respectively disposed in cooperating clamping relation to said wire-holding surfaces each operatively arranged for axial movement in said body through a clamping stroke of a selected distance beyond that of said prescribed initial distance required in said movement of each said clamping rod from a starting clearance position into pressing engagement against one of said wire length ends, and two pressure air cylinders and cooperating piston rods disposed therein operationally connected to actuate each said clamping rod through said clamping stroke for said prescribed distance and whatever portion of said selected distance therebeyond that is necessary for establishing said pressing engagement of each of said clamp against said wire length end, said pressure air cylinders being operationally arranged in pushing contact against the end of said clamping rods remote from said opposite ends thereof having said pressing engagement against said wire length ends and exerting a bias provided by said pressure air effective to cause unimpeded movement of said rods from starting clearance positions thereof to terminating positions as determined by the contact of said rods against said cooperating wire length ends, whereby each said rod moves through said clamping stroke, which is adjustably enlarged, in response to said pressure air until firmly against said wire length end positioned in front of said wire-holding surface despite increases in the distance actually required to be traversed during succeeding clamping strokes.

4,177,843
WIRE STRAIGHTENER DIE
Douglas R. Sarver, 810 Karen Dr., Kingsville, Md. 21087
Filed May 8, 1978, Ser. No. 903,713
Int. Cl.[2] B21F *1/02*
U.S. Cl. 140—147 **7 Claims**



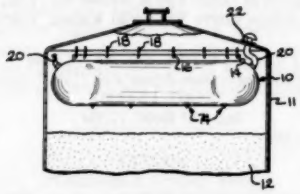
1. A wire straightener die consisting of a single structure and comprised of:
   a metal body; and
   a hardened core therethrough, said core being centrally located in said metal body, said core having a passageway therethrough, said passageway having a central straight portion with each end thereof continuing into an ever widening bell-shaped flare to the respective end of said hardened core, said hardened core being of a lesser length than said metal body, said metal body beyond the respective ends of said hardened core being flared to communicate said passageway with the exterior of said metal body.

4,177,844

SILO BREATHER BAG

Ralph L. Kuss, and Jerry J. Hickle, both of Findlay, Ohio, assignors to Kuss Corporation, Findlay, Ohio

Filed Sep. 25, 1978, Ser. No. 945,226
Int. Cl.[2] A45C 9/00; B65B 3/00; B65D 25/02
U.S. Cl. 150—1 **11 Claims**



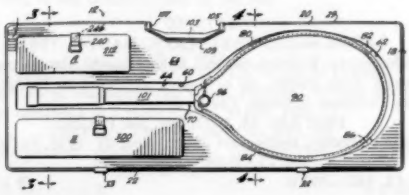
1. A bag adaptable for use in sealed structures to maintain pressure equilibrium comprising, in flat preassembly configuration, two generally semi-circular panels, both of said panels having a generally semi-circular edge with truncated end edges intersecting a notched chordal edge and said truncated end edges intersecting at an acute angle, a third panel having a generally hour-glass shape with two opposed generally arcuate edges, terminal portions of each of said arcuate edges defining one edge of an acute angle projection, the other edge of each of said acute angle projections intersecting one edge of an irregular flap at an acute angle, each of said irregular flaps defining one edge of an inwardly directed notch having edges of unequal length, whereby in assembled configuration, said semi-circular and truncated edges of one of said semi-circular panels are sealed to corresponding edges of said other of said semi-circular panels, said arcuate edges of said hour-glass-like panel are sealed to said chordal edges of said semi-circular panels and said projection, notch and flap edges are sealed to adjacent corresponding edges.

4,177,845

RACQUET DISPLAY CASE

Franklin S. Intengan, 66 W. 81st. St. Apt. W-122, Hialeah, Fla. 33014

Continuation-in-part of Ser. No. 851,143, Nov. 14, 1977, abandoned. This application Apr. 6, 1978, Ser. No. 894,036
Int. Cl.[2] A45C 11/00
U.S. Cl. 150—52 G **15 Claims**



1. A racquet case for carrying, displaying and storing a racquet of a predetermined overall length, the racquet having a handle of a predetermined cross sectional area and a head end of a predetermined thickness and span, said case comprising:

a rigid frame defining a center opening, the rigid frame including an upper and lower run in spaced parallel relation and of a length substantially equal to but slightly greater than that of the overall length of the racquet, and said frame including a first and second end run in spaced parallel relation with respect to one another and extending between said upper and lower runs, and said upper and lower runs being spaced from one another a distance substantially equal to, but slightly greater than the span of the head end of the racquet, and

each of said runs having an outer and an inner surface and spaced side surfaces extending from the outer surface and said side surfaces of each run being equispaced from one another defining a medial main plane of symmetry of said frame,

means for holding the racquet in confining relation to the center opening extending from the frame to hold the racquet between the runs with the main plane of the racquet oriented generally coincident with the plane of symmetry, with the handle generally parallel to the upper and lower runs, and the head end adjacent the second end run, and

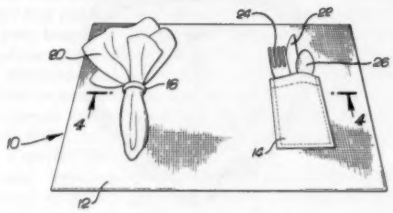
compartment means including access means for opening and closing said compartment means carried by the frame and extending along the racquet handle.

4,177,846

ROLL-UP PLACE MAT

Jean Rountree, 851 N. Michigan Ave., Pasadena, Calif. 91104

Filed Oct. 16, 1978, Ser. No. 951,639
Int. Cl.[2] A45F 5/04
U.S. Cl. 150—52 C **4 Claims**



1. A roll-up place mat having means for holding a napkin in place and dining flatware in place, while rolled up, comprising:

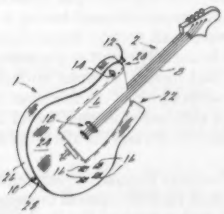
a flexible rectangular top sheet member having an attached pocket member to receive dining flatware, and an attached ring member to receive a napkin, said top sheet member being superimposed on a lining sheet member of equal size, said sheet member and said lining member having their respecti e edges connected together and wherein the outer surface of said lining member has an attached tying member to tie and maintain said roll-up place mat in a rolled up position while containing a napkin in place and dining flatware in place.

4,177,847

SLIP-ON GUITAR COVER

Stanley G. Spindler, 1926 Farmbrook, Troy, Mich. 48098

Filed Feb. 5, 1979, Ser. No. 9,609
Int. Cl.[2] G10G 7/00
U.S. Cl. 150—52 R **7 Claims**



1. A slip-on cover for protecting the sound box of an electric guitar having a neck, a bridge portion and a plurality of control buttons, said cover comprising: a front sheet, a side sheet and a back sheet, each comprising a soft absorbant cloth material

and each of said front, side and back sheets being sewn together at adjacent perimeter edge portions; said front sheet having a generally U-shaped recess therein adapted to align with said bridge portion, said front sheet further having an elongated first slit extending from the closed end of said recess, and having fastening means for connecting opposing sides of said slit proximate to said recess, and wherein said front sheet has a plurality of second slits therein adapted to receive said control buttons, the longitudinal axis of said second slits being aligned at about a 30 degree angle from the longitudinal axis of said guitar cover.

4,177,848

RUN - FLAT TIRE

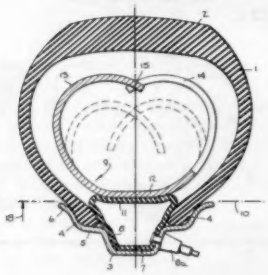
Sjirk Van der Burg, Embourg, Belgium, assignor to Uniroyal Aktiengesellschaft, Aachen, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 831,829

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653658

Int. Cl.[2] B60C *17/04*

U.S. Cl. 152—158 **15 Claims**



10. In a pneumatic, tired wheel having a tubeless inflatable tire mounted on the rim of the wheel and having an inner tire surface, the improvement comprising a toroidal support device to enable the tired wheel to travel in a flat state, said support device comprising:

an inflatable, toroidal inner tube located in a well of the rim and having sidewall portions directly engageable with the tire beads to elastically clamp the tire beads against the rim flanges, said tube radially extending outwardly from the well of the rim to or slightly beyond the radially outer edges of the rim flanges, the radially outward portion of said tube having a radially external outer circumferential area, said tube being inflatable independently of the tire; and

a separate noninflatable toroidal support element having sidewall portions that are discontinuous with corresponding sidewall portions of said inner tube, said support element being mounted on the radially extending outer circumferential area of said inner tube and being normally free from contact with said tire beads when the tire is in an inflated state, said support element having a radially internal circumferential wall section impervious to puncture, lying adjacent the radially external circumferential area of the inner tube and having an outer surface area spaced from the inner surface area of the tire when the tire is in its inflated state so that under normal travel conditions the support element does not contact the inner surface area of the tire,

and wherein the radially internal, circumferential wall section of the toroidal support element consists of a material or is reinforced with a material that is not extensible in the circumferential direction,

and the radially internal, circumferential wall section has sufficient axial width such that, upon a pressure drop in the tire, said wall section can completely cover and protect the radially external circumferential area of the inner tube,

and wherein the support element is circular in cross section.

4,177,849

SAFETY WHEEL

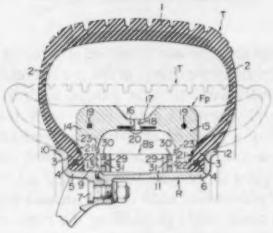
Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Izumiotsu and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 6, 1978, Ser. No. 922,506

Claims priority, application Japan, Jul. 7, 1977, 52-81208; Jul. 7, 1977, 52-81210; Jul. 7, 1977, 52-81211

Int. Cl.[2] B60C *17/04*

U.S. Cl. 152—158 **12 Claims**



1. A safety wheel for vehicle use of the type including a split rim (R) comprised of at least two rim sections arranged axially adjacent to each other, a tubeless tire (T) mounted on said split rim, and a flat protector (Fp) arranged in the air chamber defined in said tubeless tire by said split rim for bearing engagement with the tread portion of said tubeless tire when the air sealed in the latter is lost, said flat protector being fitted around the inner periphery thereof to the rim base portion of said split rim and supported at the opposite sides by the respective bead portions of said tubeless tire, said safety wheel being characterized in that said flat protector takes the form of an annular elastic member of substantially H-shaped radial cross section having an annular recess (**17**) formed in the middle of the outer peripheral surface thereof, including a pair of spaced opposite annular side wall portions (**14, 15**) and an annular bridging wall portion (**16**) which extends between those sections of said opposite side wall portions lying slightly radially inside of the outer peripheral surfaces thereof to integrally interconnect said opposite side wall portions.

4,177,850

LARGE-SIZED PNEUMATIC RADIAL TIRE

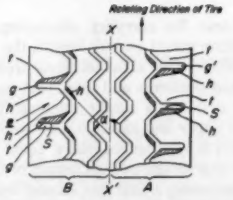
Hiroshi Ogawa, Kodaira; Shigeta Aoki, Higashi-Murayama, and Tatsuo Arai, Fuchu, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 18, 1977, Ser. No. 825,732

Claims priority, application Japan, Aug. 31, 1976, 51/103827

Int. Cl.[2] B60C *11/04, 11/06*

U.S. Cl. 152—209 R **8 Claims**



1. A large-sized pneumatic radial tire comprising a tread including grooves having alternately directed inclined portions

at an angle of 30°–90° with respect to the circumferential direction of the tire, a belt composed of a plurality of rubberized layers each containing steel cords, and a carcass of a substantially radial construction; said tread including two half regions divided with respect to a crown center, one of said regions being a region in a direction of plysteer which is produced due to the tire construction and to the ground contact reaction force acting on said steel cord of at least one rubberized layer disposed near said tread and which acts upon the tire, and the other region being a region opposite to the direction of plysteer; characterized by only providing reinforcements on the kicking-out sides of the walls of said inclined portions of said grooves in said region opposite to the direction of plysteer.

4,177,851

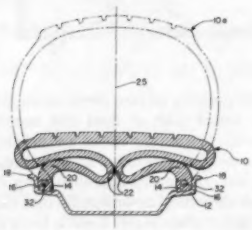
FOLDABLE SPARE TIRE

Michael L. Gill, Akron, and William M. Hopkins, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 666,852, Mar. 15, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,883

Int. Cl.[2] B60C *5/00*

U.S. Cl. 152—353 R **4 Claims**



1. An inflatable tire having a tread, sidewalls, and beads, said tread having, when the tire is deflated, a diameter materially smaller than when it is inflated, said tire comprising an endless inextensible bead core in each of said beads, at least one ply of reinforcing cords extending to and between said bead cores, and means reducing the parasitic stress in each bead core comprising an annular ply positioning element disposed in concentric surrounding coplanar relation about each bead core and axially inward of the or each said ply in the respectively associated bead, the or each ply in the bead region being extended from the bead core outwardly of the mid-plane of the bead core, in the deflated state of the tire.

4,177,852

STRUCTURE OF PNEUMATIC TIRE COVERS

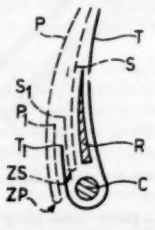
Claudio Merli, Cormano, and Carlo Francia, Monza, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Oct. 18, 1977, Ser. No. 843,106

Claims priority, application Italy, Oct. 19, 1976, 28523 A/76

Int. Cl.[2] B60C *9/02*

U.S. Cl. 152—354 R **2 Claims**



1. A pneumatic tire cover of the type comprising a peripheral reinforcement formed by two or more layers of plies whose threads are arranged in a predominantly longitudinal direction and a carcass formed by two reinforcements, each having a specific function wherein:

the inner structure is formed by at least one radial ply formed by threads (cords) of aromatic polyamide and said threads lie in radial planes, or they form small angles with said planes;

the outer structure is formed by at least two plies with threads (cords) of a material different from that of the inner structure, the said material having elongation values from 2 to 5 times greater than those of the aromatic polyamide for loads proportional to the breaking load, said threads being furthermore arranged in alternately crossed directions from one ply to another, so as to form angles from 7° to 35° with the radial planes and equivalent angles from 14° to 70° between successive plies;

the inner structure being furthermore able to bear on its own the inflation pressure, the outer structure being able to limit the lateral flexures of the tire by opposing the forces directed along the axis of rotation; and

wherein the ply or plies of the inner structure are anchored to the bead wire by a folded back edge flap or flaps and the plies of the outer structure are not anchored to said bead wire and are folded back upon themselves adjacent their free edges so as to form ribs, these ribs being at least in part, located in the space between the ply or plies of the inner structure and the folded back edge flap or flaps.

2. A pneumatic tire cover of the type comprising a peripheral reinforcement formed by two or more layers of plies whose threads are arranged in a predominantly longitudinal direction and a carcass formed by two reinforcements, each having a specific function wherein:

the inner structure is formed by at least one radial ply formed by threads (cords) of aromatic polyamide and said threads lie in radial planes, or they form small angles with said planes;

the outer structure is formed by at least two plies with threads (cords) of a material different from that of the inner structure, the said material having elongation values from 2 to 5 times greater than those of the aromatic polyamide for loads proporational to the breaking load, said threads being furthermore arranged in alternately crossed directions from one ply to another, so as to form angles from 7° to 35° with the radial planes and equivalent angles from 14° to 70° between successive plies;

the inner structure being furthermore able to bear on its own the inflation pressure, the outer structure being able to limit the lateral flexures of the tire by opposing the forces directed along the axis of rotation; and

wherein the ply or plies of the inner structure are anchored to the bead wire and the plies of the outer structure are not anchored to the bead wire and are folded back upon themselves adjacent their free edges so as to form ribs, these ribs being at least in part located outside the space between the ply or plies of the inner structure and the folded back edge flap or flaps.

4,177,853

VENETIAN BLIND ASSEMBLY AND MOUNTING MEANS THEREFOR

Samuel J. Anderson, and James M. Anderson, both of Swarthmore, Pa., assignors to International Blind Company, Chester, Pa.

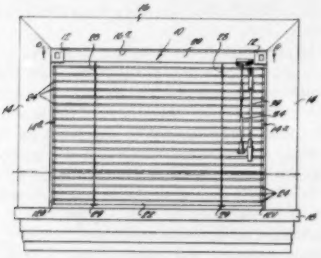
Filed May 19, 1977, Ser. No. 798,649

Int. Cl.[2] E06B *9/30*

U.S. Cl. 160—168 R **8 Claims**

1. A bracket for mounting the head rail of a venetian blind to a support surface of a window opening or the like comprising a generally box-like member having an open end to receive the outer terminal end of the head rail including a base panel confronting one end of the head rail and a front panel actuat-

able between an open position permitting insertion of said one end of the head rail and a closed position confining the said one end of the head rail, means mounting the said front panel for movement about multiple pivot points and means to latch said front panel in a closed position, said multiple pivot points



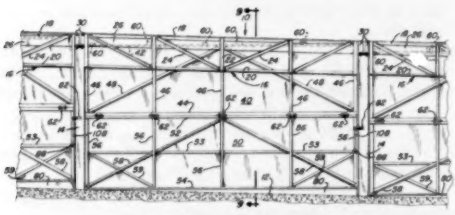
permitting pivotal and translatory movement of said front panel relative to said base, said translatory movement being the direction of securing said latch means and wherein the load on the front panel from said head rail acts in a direction perpendicular to said latching direction.

4,177,854

DOOR MOUNTING, OPENING AND LOCKING APPARATUS FOR BUILDINGS CONFORMING TO SLOPING TERRAIN

Wilfred H. DeVore, Box 75A Star Rt., Littleton, Colo. 80120

Filed Dec. 10, 1976, Ser. No. 749,469
Int. Cl.[2] E05D *15/26*
U.S. Cl. 160—207 **8 Claims**



1. Door apparatus adapted for use in a building that is constructed with a floor and an overhead structure, both of which slope from the horizontal, comprising:

two structural columns extending upwardly from said floor in parallel, spaced apart, relation to each other, said columns being oriented vertically but not perpendicular to the floor and defining a door space between them and each having on its upper extremity a flat bearing plate;

a header truss supported at each end over the door space by said columns above and substantially parallel to the sloping floor of a building and spanning the door space, said truss including an upper member and a lower member in parallel, spaced-apart relation to each other, both of said upper and lower members being oriented parallel to said floor and on a slope away from horizontal, a plurality of intermediate structural brace members attached between said upper and lower members, and bracket means at each end of said truss connected to and extending downwardly from said upper member of said truss and mounted on said bearing plate on the upper end of said column for supporting said truss over said column and adapted to conform to the angle between the upper member of said truss and said column when a load is applied thereto;

a flat elongated rectilinear face mounting plate rigidly attached to said truss on said intermediate brace members between and substantially parallel to said upper and lower members but not extended over the entire span of said truss, the width of said mounting plate being sufficiently large such that all points of a straight horizontal line lay on said plate; and

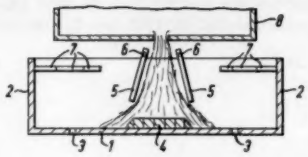
hanger means attached to said mounting plate along said straight, horizontal line and adapted for suspending a door in said door space.

4,177,855

TUNDISH AND METHOD OF POURING MOLTEN METAL THEREWITH

Jean L. Duchateau, Jouy-en-Josas, and Bernard E. Sautiere, Sedan, both of France, assignors to Foseco Trading A.G., Chur., Switzerland

Filed Mar. 28, 1978, Ser. No. 891,271
Claims priority, application United Kingdom, Mar. 28, 1977, 13002/77; Sep. 2, 1977, 36753/77
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—82 **26 Claims**



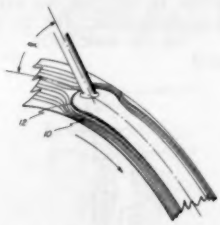
1. A method of pouring molten metal comprising providing an intermediate vessel with at least one nozzle disposed in pouring relationship to another vessel, positioning in the intermediate vessel pivotally mounted at an upper edge or in a wall portion thereof, two refractory heat-insulating slabs in spaced apart relation and extending downwardly into the intermediate vessel, pouring the molten metal from a ladle into the space between the slabs so that the slabs contain splash of the metal on initial pouring, and continuing pouring in such a manner that the slabs are raised by the molten metal to a generally horizontal position on top of the molten metal in the intermediate vessel.

4,177,856

CRITICAL GAS BOUNDARY LAYER REYNOLDS NUMBER FOR ENHANCED PROCESSING OF WIDE GLASSY ALLOY RIBBONS

Howard H. Liebermann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,113
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.
Int. Cl.[2] B22D *11/06, 11/16*
U.S. Cl. 164—87 **3 Claims**



1. A method for producing wide glassy alloy ribbons including the process steps of

(a) casting a melt of a glassy metal alloy onto a surface wheel having a wheel diameter D and at a predetermined impingement angle αtherewith;

(b) adjusting the substrate wheel speed S and the melt jet velocity to form a melt puddle of width w on the substrate wheel surface;
(c) adjusting the prevalent ambient atmospheric pressure to a predetermined value,
(d) producing a glassy alloy ribbon from the melt puddle, and
(e) maintaining the Reynolds number Re for the gas boundary layer flow about the melt puddle at less than a critical value Re^{crit} of about 2000 ± 100 whereby the Reynolds number Re is expressed by the following formula

$$Re = K(1-\cos\alpha)DSwP[M/\eta]$$

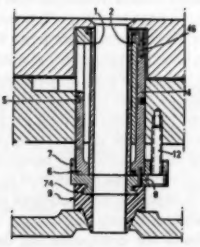
wherein
Re = Reynolds number
K = constant which takes into consideration all conversion factors to obtain dimensional consistency
α = impingement angle between the melt jet and the tangent to the substrate surface at the impingement point
D = substrate wheel diameter
S = substrate wheel speed
w = ribbon or puddle width
P = ambient atmospheric pressure under which casting is conducted
M = molecular weight of ambient gas in which casting is conducted
η = viscosity (20° C.) of ambient gas in which casting is conducted.

4,177,857

BLOW NOZZLE, NOTABLY FOR FOUNDRY CORES

Jacques Chamdru, Le Mesnil St. Denis, France, assignor to Regie Nationale des Usines Renault, Zola, France

Filed Sep. 6, 1977, Ser. No. 830,795
Claims priority, application France, Sep. 13, 1976, 76 27461
Int. Cl.[2] B22C *15/24*
U.S. Cl. 164—200 **7 Claims**



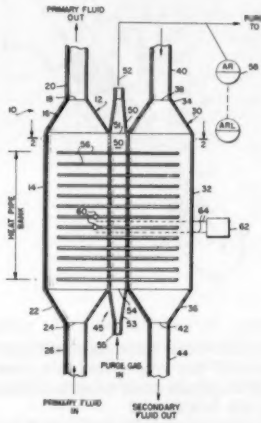
1. In a blow nozzle intended for foundry use according to the so-called hot-box process in the manufacture of sand molds and cores having a central replaceable barrel member which can be of different lengths and a surrounding sleeve means to provide cooling fluid in contact with said barrel member, the improvement wherein
said surrounding sleeve means comprises a female sleeve provided with diametrally opposite slots and a male sleeve in sliding relation to said female sleeve provided with diametrally opposite slots, and further comprising
index means to maintain the slots formed in said sleeves in mutual alignment, and
tip holder means to secure said sleeves to a hot-box filling tray, said tip holder means having a resiliently fitting plastic tip whereby the length of the nozzle can be adjusted by using barrels having different lengths.

4,177,858

HEAT EXCHANGER

Ernest L. Daman, Westfield, and Robert A. McCallister, Mountain Lakes, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 22, 1977, Ser. No. 826,602
Int. Cl.[2] F28D *15/00;* **F28F** *11/00*
U.S. Cl. 165—11 **8 Claims**



1. A heat exchanger comprising; a first fluid chamber for maintaining flow of a primary fluid; a second fluid chamber for maintaining flow of a secondary fluid, said second chamber spaced apart from said first chamber; a heat pipe including a cylindrical member closed at the ends thereof to contain a working fluid therein, said heat pipe extending in said first chamber and second chamber and having a portion between said chambers; a third fluid chamber for maintaining flow of a purged fluid, said portion of said heat pipe positioned within said third chamber, said chamber including side walls, a top closure, a bottom closure, inlet means for introducing said third fluid and outlet means for removing said third fluid; means for detecting leakage of said primary or said secondary fluid into said heat pipe and leakage of said working fluid from said heat pipe; and means for detecting primary or secondary fluid in said third chamber, whereby primary or secondary fluid leaking from said first and second chambers into said third chamber which is carried in said purged fluid is detected.

4,177,859

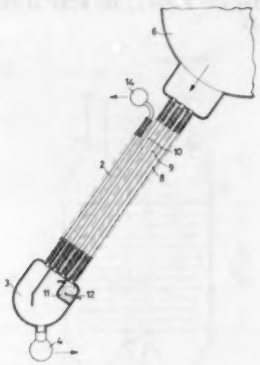
AIR CONDENSER

Maurizio Gatti, Sesto San Giovanni; Sergio Tavano, and Basilio Checcacci, both of San Donato Milanese, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Apr. 6, 1978, Ser. No. 894,140
Claims priority, application Italy, Apr. 26, 1977, 22805 A/77
Int. Cl.[2] F28B *9/08*
U.S. Cl. 165—11 **5 Claims**

1. An air condenser comprising:
finned tube bundles positioned at a slope relative to the horizontal plane, wherein the tubes are arranged in rows and are divided into two zones,
an inlet manifold connected to one end of the tubes in said first zone for feeding vapor thereinto,
a collection header connected to the tubes of both zones at the other ends thereof for collecting condensate from said tubes and for feeding residual vapors from said tubes of said first zone into each of the tubes of said second zone,
collection means connected to the one end of each tube of said second zone for collecting residual vapors from each of said tubes in said second zone,
said tubes of each of said zones being adapted to be swept by

cooling air such that the air first strikes the tubes of said first zone and then each of said tubes of said second zone, and wherein the outermost tube of said first zone is adapted to be initially struck by said cooling air so that vapor in said first tube of said first zone is almost completely condensed,



an inspection well within said collection header open to said header and said first tube of said first zone for receiving condensate therefrom prior to such condensate entering said collection header, and

a sensor extending into said inspection well for checking the temperature of the condensate therein to prevent the condensate from reaching freezing or solidifying temperatures.

4,177,860

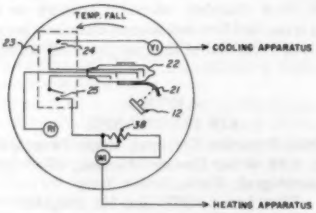
HEATING AND COOLING THERMOSTAT WITH CHANGEOVER SWITCHING OPERATED UPON CONTROL POINT ADJUSTMENT

Vern C. Johnson, Minneapolis; Virgil K. McCormick, Wayzata, and John M. Whitney, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 712,119, Aug. 5, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,053

Int. Cl.[2] **F25B** *29/00;* **H01H** *37/52, 37/12*

U.S. Cl. 165—26 **14 Claims**



1. In a thermostat adapted for controlling heating and cooling apparatus to maintain a predetermined temperature in a space, comprising,

a base member,

space temperature responsive switch means attached to said base member,

first switch means on said base member adapted to connect said temperature responsive switch means to control the heating apparatus,

second switch means on said base member adapted to connect said temperature responsive switch to control the cooling apparatus,

single member temperature control point adjustment means mounted on said base member having a first and a second range of temperature adjustments,

first mechanical means connecting said single adjustment means to said temperature responsive switch to select a predetermined control temperature to be maintained in the space when said adjustment means is in either said first or said second range of temperature adjustments, and

further mechanical means connecting said single adjustment means to said first switch means whereby said space temperature responsive switch means is adapted to control the heating apparatus to maintain a predetermined space temperature of said first range when said single adjustment means is in said first range of temperature adjustments,

said further mechanical means connecting said single adjustment means to said second switch means whereby said space temperature responsive switch means is adapted to control the cooling apparatus to maintain a predetermined space temperature of said second range when said single adjustment means is in said second range of temperature adjustments.

4,177,861

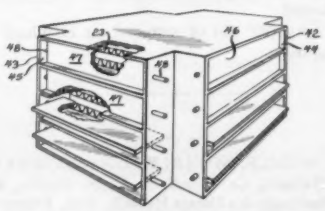
RECUPERATOR STRUCTURE

Norman F. Costello; Homer D. Huggins, and Stephen S. T. Kao, all of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Nov. 7, 1977, Ser. No. 848,813

Int. Cl.[2] **F27D** *13/00*

U.S. Cl. 165—101 **3 Claims**



1. Recuperator structure for recovering heat values from a hot gas stream comprising exhaust gases from a combustion burner, comprising: an exhaust gas conduit from said burner; a combustion air conduit to said burner; a heat exchanger having exhaust gas passages in heat transfer relationship with combustion air passages for transferring heat from the exhaust gas to said combustion air; temperature control means for selectively restricting the volumetric flow of at least one of said combustion air and said exhaust gases through the heat exchanger for controlling the temperature in said heat exchanger; means for arranging said heat exchanger exhaust gas passages and combustion air passages in a plurality of modules of the heat exchanger with all modules being positioned in separate passages each controlled by a separate flow control damper; and force yieldable heat insulation means separating each said module from adjacent modules for compensating for thermal dimensional changes and for sealing the gases in the adjacent modules from each other.

4,177,862

SPRINKLER ARRANGEMENTS

Geddes A. Bray, Manchester, England, assignor to Mather & Platt Limited, Manchester, England

Filed Mar. 29, 1978, Ser. No. 891,357

Claims priority, application United Kingdom, Jun. 15, 1977, 24904/77

Int. Cl.[2] **A62C** *35/00, 37/10*

U.S. Cl. 169—17 **6 Claims**

1. A sprinkler arrangement, comprising:

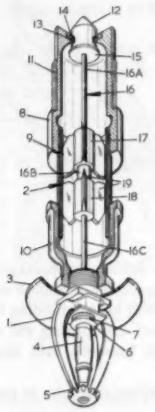
(a) a sprinkler head operable on attainment of a predetermined temperature;

(b) at least two interconnected pipe sections comprising a length of connection pipework to one end of which pipework the sprinkler head is attached and the other end of

which defines a valve seat and is adapted for attachment to a main pipework system, and which pipe sections are relatively adjustable to vary the length of the connection pipework;

(c) an inert plug of resilient material which is located in the valve seat and which is substantially cylindrical in shape so that it can form a fluid-tight seal with the valve seat when located therein anywhere along its cylindrical length; and

(d) a strut in the form of a rod located along the length of the connection pipework between the inert plug and the



sprinkler head to maintain the plug in a sealing relationship with the valve seat anywhere along the cylindrical length of the latter whereby the sprinkler head is not overloaded by the force of the strut pressing thereon;

attainment of said predetermined temperature causing operation of the sprinkler head permitting movement of the strut and thereby movement of the inert plug out of the valve seat to allow a flow of extinguishant into and through the connection pipework to the sprinkler head when the arrangement is attached to the main pipework system.

4,177,863

SAFETY LIQUID DISPENSER

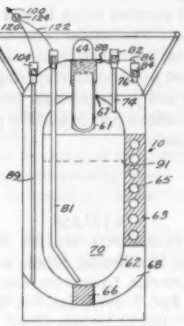
Sydney Simon, 936 Oranmore St., Pittsburgh, Pa. 15201

Continuation-in-part of Ser. No. 661,754, Feb. 26, 1976, Pat. No. 4,019,583, which is a continuation-in-part of Ser. No. 624,161, Oct. 20, 1975, Pat. No. 4,019,649, which is a continuation-in-part of Ser. No. 550,889, Feb. 19, 1975, Pat. No. 4,000,726. This application Mar. 24, 1977, Ser. No. 780,801

Int. Cl.[2] A62C *35/12*

U.S. Cl. 169—62 **16 Claims**

1. An inflammable fluid safety tank comprising a double walled tank body, a sleeve means secured to the outer wall structure and inner wall structure of said double walled tank body, said inner wall structure of said tank body forming an intermediate enclosed container, a plurality of support plate members connected to and spacing said outer wall structure from said inner wall structure, the outer wall structure of said double walled tank body being provided with a circular handle, said handle being supported above the tank body by a plurality of mounts, the diameter of said circular handle being greater than the outside diameter of the tank body, fluid transfer means mounted to said outer tank surface and communicating with an outer chamber defined by the inner surface of the tank body's outer wall and the outer wall of the intermediate enclosed container, a second fluid transfer means mounted to said tank body and communicating with said intermediate enclosed container, a pressurized gas container assembly including a pressurized gas container removably mounted to said sleeve means and positioned within said intermediate enclosed container, said gas container assembly comprising means for selectively connecting said gas container for communication with at least one of said fluid transfer means to discharge pressurized gas into said intermediate enclosed container and outer chamber, a first material contained in said intermediate



enclosed container and a second material contained in said outer chamber and discharge means mounted to said tank body adapted to selectively discharge pressurized material from either the intermediate enclosed container or the outer chamber.

4,177,864

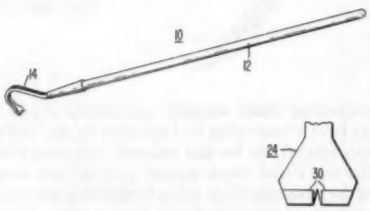
GARDEN CROOK

Edlo Donnini, 17 Wayne Ave., Jeannette, Pa. 15674

Continuation of Ser. No. 720,760, Sep. 7, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,328

Int. Cl.[2] A01B *1/08*

U.S. Cl. 172—371 **8 Claims**



1. A garden tool comprising an elongated handle defining a longitudinal axis; and a unitary steel member attached to one end of said elongated handle which comprises:

a longitudinally extending first straight portion for engaging one end of said elongated handle and defining a longitudinal axis coincident with said longitudinal axis of said handle;

a second straight portion extending from said first straight portion at an angle of approximately 40°;

a partial circular portion, having a rectangular cross section, extending from said second straight portion, to a position past the axis defined by the longitudinally extending first straight portion;

a free end portion formed past the longitudinal axis defined by said first straight portion extending from said partial circular portion having a flat planar surface which terminates in a free end having a straight edge, said partial circular portion having a minimum outer curvature of a radius, from a point in line with the longitudinal axis of said elongated handle, greater than twice the width of the widest portion of said flat planar surface;

said flat planar surface merging continuously into a side of

said partial circular portion and being disposed in a plane approximately perpendicular to the longitudinal axis of said elongated handle;

said flat planar surface having a width less than four times the width of the side of said partial circular portion into which it merges;

said unitary steel member being forged from a spring steel member having a rectangular cross-sectional area;

said flat planar surface tapering in width to said free end from said widest part and also tapering in width from said widest part to said partial circular portion; and

the width of said widest part of said flat planar surface being less than two inches.

4,177,865

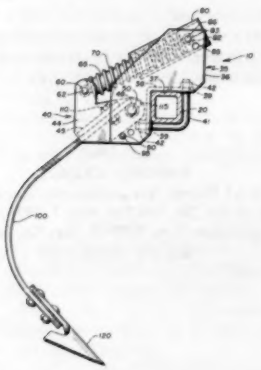
CULTIVATOR TOOL SHANK ASSEMBLY

Howard L. Lewison, Hutchinson, Minn., assignor to Dynamics Corporation of America, Greenwich, Conn.

Filed Apr. 7, 1978, Ser. No. 894,361

Int. Cl.[2] A01B *35/24*

U.S. Cl. 172—705 **7 Claims**



1. A cultivating shank assembly comprising, a tool shank adapted to have a cultivating tool mounted on one end of the same, a mounting frame for said assembly including a mounting portion and a tool shank support portion, said mounting portion of the mounting frame being formed of a pair of spaced plate members said mounting frame portion being adapted to be mounted on a transversely extending frame bar of a cultivator with the mounting frame portion extending forward and above the cultivating frame bar at one end and to the rear of the transversely extending frame bar at the other end, said tool shank portion having the tool shank mounted thereon, means included in the tool shank portion for pivotally mounting one end of the tool shank portion on the mounting portion of the mounting frame, a pressure rod pivotally attached to the other end of the tool shank portion, a compression bias spring positioned around the pressure rod with one end bearing against the tool shank portion, a cylindrical spring retainer encircling the spring at the other end, said spring retainer being pivotally mounted at the forward end of the mounting frame portion between the plate members, said pressure rod terminating within said cylindrical spring retainer said cylindrical spring retainer being comprised of a cylindrical member having a diametrical dimension such as to fit around the spring and the cylindrical member forming the pressure rod, and including a journal member positioned in one end of the cylindrical spring retainer against which the other end of the spring abuts with the journal member being retained in the plate members of the mounting frame portion by means of a pin positioned through a pair of apertures therein.

4,177,866

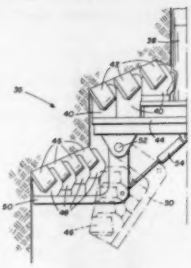
SYSTEM FOR BORING RAISES HAVING PORTIONS OF DIFFERENT DIAMETERS

Howard E. Mitchell, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 30, 1978, Ser. No. 910,725

Int. Cl.[2] E21C *23/00*

U.S. Cl. 175—53 **7 Claims**



1. A method of raise drilling by enlarging a pilot hole extending between an upper level of a mine and a lower level of a mine into a large diameter hole extending between said upper level and said lower level, comprising the steps of:

boring said pilot hole between said upper level and said lower level;

positioning a raise drilling machine at said upper level of a mine;

rotating and drawing a raise head along said pilot hole from said lower level to said upper level to enlarge the pilot hole to form said large diameter hole by disintegrating the formations surrounding the pilot hole, said raise head having a primary section for disintegrating the formations surrounding the pilot hole out to a first radial distance from the pilot hole and a secondary stage; and

expanding said raise head during the rotating and drawing step to position said secondary stage at a second and greater radial distance from the pilot hole.

4,177,867

SELF-DRILLING DOWEL WITH AN INCLINED ROLLING HEAD

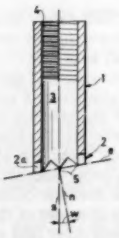
Josef Ente[illegible], Frastanz, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 20, 1977, Ser. No. 862,489

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658290

Int. Cl.[2] F16B *13/00*

U.S. Cl. 175—400 **1 Claim**



1. A self-drilling dowel for use in drilling a borehole in a hard receiving material such as concrete, rock and the like comprising an axially elongated tubular-shaped member, a drilling head at one end of said member, said drilling head having a plurality of cutting teeth with each of said teeth

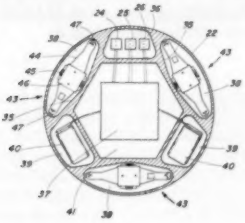
having a tip, said tubular-shaped member has an inner wall surface and an outer wall surface wherein the improvement comprises that the tips of said teeth extend from the inner wall surface to the outer wall surface of said tubular-shaped member, and the tips of each said teeth are located in a single plane and a line perpendicular to the plane and intersecting the axis of said tubular-shaped member forms an angle in the range of 4° to 9° with the axis.

4,177,868

WEIGHT-MEASURING AND DISPLAY DEVICE

Louis H. Sanders; Kenneth L. Watkins, and Galt S. Bowen, all of Albuquerque, N. Mex., assignors to Bio-Dynamics Inc., Indianapolis, Ind.

Filed Jan. 30, 1978, Ser. No. 873,530
Int. Cl.[2] G01G *3/14, 19/44*
U.S. Cl. 177—211 **27 Claims**



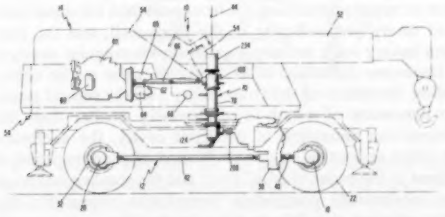
1. A rigid structure for supporting a load positioned thereon which comprises:
- a top plate;
- a bottom plate positioned beneath and spaced apart from said top plate;
- a plurality of deflection beams arranged between said top and said bottom plates and supported by said bottom plate;
- means for transmitting a force to each of said plurality of said deflection beams to produce deflection therein, said forces resulting from a load positioned on said top plate;
- means for sensing a strain present within each of said plurality of deflection beams, said sensing means providing a measurable indication proportional to said load; and
- each one of said plurality of deflection beams having a strain sensing area with a transverse cross-sectional area which decreases as a function of increased longitudinal distance from said force thereby producing a near constant strain throughout said strain sensing area in response to said force, said sensing means being positioned on said strain sensing areas.

4,177,869

SWIVEL JOINT FOR A VEHICLE

Wesley I. Crabiel, Galion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 21, 1978, Ser. No. 898,679
Int. Cl.[2] B62D *27/00*
U.S. Cl. 180—6.58 **10 Claims**



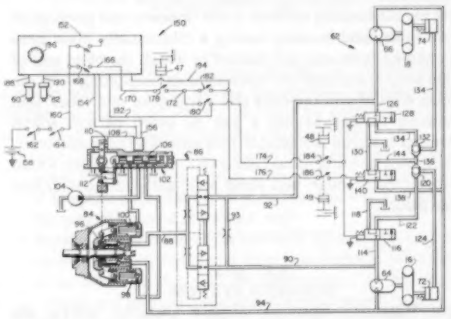
1. In a vehicle of the type comprising a mobile carrier, a pedestal mounted thereon for rotation about a vertical axis, and a swivel joint connected between said pedestal and said carrier and through which energy is transmitted, the improvement wherein said swivel joint comprises:
- a stationary sleeve mounted on said carrier along said vertical axis;
- a rotary sleeve mounted coaxially around the exterior of said stationary sleeve;
- said stationary sleeve including a fluid passage extending parallel to said axis for transmitting pressurized fluid;
- said rotary sleeve including a fluid port;
- one of said sleeves including an annular channel communicating said fluid port with said passage during rotation of said pedestal;
- an upper gear box mounted at an upper end of said rotary sleeve for rotation therewith,
- a lower gear box mounted at a lower end of said stationary sleeve;
- a hollow vertical shaft extending coaxially through said stationary and rotary sleeves for transmitting mechanical energy;
- upper gear means in said upper gear box for connecting said shaft to rotary means on said pedestal, and
- lower gear means in said lower gear box for connecting said shaft to rotary means on said carrier;
- electrical connector means mounted adjacent one end of said shaft for rotation relative thereto, said connector means being connectable to electrical conductors said shaft including an open upper end and an open bottom end for receiving electrical conductors to conduct electrical energy between said pedestal and carrier.

4,177,870

HYDROSTATIC FRONT WHEEL DRIVE SYSTEM

John I. Henn, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 30, 1978, Ser. No. 910,645
Int. Cl.[2] B60K *25/04*
U.S. Cl. 180—243 **9 Claims**



8. In combination with a vehicle including a reversible main traction drive transmission connected to drive main traction drive wheels, and first and second auxiliary traction wheels, an auxiliary traction drive system, comprising: a reversible variable displacement pump including a direction and displacement controller; first and second hydraulic motors connected in parallel with each other in a closed loop hydraulic circuit connecting the pump to the motors; first and second drive connection means respectively connecting the first and second motors to the first and second auxiliary traction wheels; said closed loop hydraulic circuit comprising a flow divider-combiner valve, a first conduit connected between a first port of the pump and the divider-combiner valve, second and third conduits connected between the divider-combiner valve and respective first ports of the motors; and a fourth conduit connecting respective second ports of the motors to a second port

of the pump; and a restricted passage connected between the second and third conduits, whereby, after the vehicle completes negotiating a turn, the restricted passage permits flow therethrough to equalize the pressure in the second and third lines to re-center the flow divider-combiner valve.

4,177,871

TOY STETHOSCOPE

W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 15, 1977, Ser. No. 860,696

Int. Cl.[2] A61B *7/02;* **H04R** *25/00*

U.S. Cl. 181—131 **5 Claims**

1. A toy stethoscope for conducting sound comprising:

a pair of flexible sound conducting tubes;

an ear piece connected to one end portion of each of said tubes; and

a soft pliable housing secured to the opposite end portions of said tubes, said housing having a substantially blind bore extending from one end thereof in which the blind end of said bore has at least one opening communicating with the open ends of said opposite end portions of said tubes, said housing further having a pad or block of soft sound damper material mounted within said blind bore and overlying said opening in said blind end for damping the sound conducted through said blind bore and said tubes to said ear pieces.

4,177,872

SPEAKER SYSTEM

Shinichi Watanabe, Matsudo; Shigeru Okazaki, Tokyo, and Mamoru Osata, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,260

Claims priority, application Japan, Mar. 11, 1977, 52-29404[U]

Int. Cl.[2] H05K *5/00;* **G10K** *13/00*

U.S. Cl. 181—144 **2 Claims**

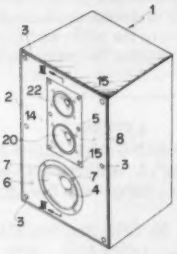
1. A speaker system comprising a cabinet;

a baffle board mounted in front of said cabinet and having first and second openings;

a woofer mounted on said baffle board so as to cover said first opening;

a sub-baffle board mounted on said baffle board so as to cover said second opening, said sub-baffle board having two openings, said sub-baffle board including a metal board and a damping plate laminated on said metal board;

a medium range speaker mounted on said sub-baffle board through said damping plate so as to cover one of said openings in said sub-baffle board; and



a tweeter mounted on said sub-baffle board through the medium of said damping plate so as to cover the other of said openings in said sub-baffle board.

4,177,873

LOUDSPEAKER EQUIPMENT

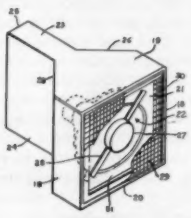
Warren Ripple, 2839 Sterling La., Sarasota, Fla. 33581

Continuation of Ser. No. 615,364, Sep. 22, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,485

The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.[2] H04R *1/28;* **G10K** *13/00*

U.S. Cl. 181—148 **7 Claims**



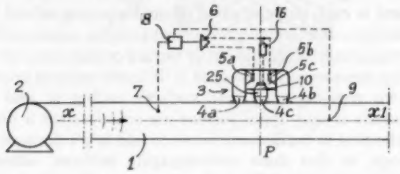
1. Loudspeaker equipment comprising a speaker and a speaker enclosure, the enclosure having enclosure walls defining a speaker chamber having front and rear intercommunicating portions, the front portion having a front wall with an opening therein and with the speaker mounted thereon and exposed through the opening, the side walls of the front portion defining a generally rectangular cavity of greater dimensions in directions paralleling the front wall than the dimension of said cavity perpendicular to the front wall, and the rear portion having walls defining a generally rectangular cavity a first transverse dimension of which is the same as the corresponding dimension of the front cavity and the second transverse dimension of which is substantially smaller than the corresponding dimension of the front cavity, the enclosure walls being at least in large part formed of sheet material of thickness of the order of 1/16" to ¼" and the speaker enclosure being substantially completely imperforate except for the speaker opening, thereby providing loudspeaker equipment in which the walls of the speaker enclosure extensively participate in the sound generation.

4,177,874

ACTIVE ACOUSTIC SOUND ABSORBER DEVICE

Theophile A. Angelini; Bernard J. P. Nayrole; Maurice J. Jessel; Georges Canevet; Gerard A. Mangiante, and Bernard Carbone, all of Marseilles, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 29, 1978, Ser. No. 891,340
Claims priority, application France, Apr. 1, 1977, 77 10497
Int. Cl.[2] F01N 1/06
U.S. Cl. 181—206 9 Claims



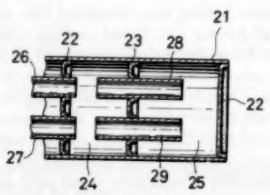
1. An active acoustic absorber device for absorbing sounds emitted by an emitter source and which propogate therefrom along a pipe having a longitudinal axis, comprising an acoustic tripole including two auxiliary sources which constitute a dipole and a third auxiliary source which constitutes a unipole; a single acoustic enclosure placed outside said pipe comprising a housing having the general form of a U including a chamber having a plane of symmetry transverse to said chamber and perpendicular to the longitudinal axis of said pipe, two lateral channels parallel to said plane and symmetrical with respect to said transverse plane of symmetry, each lateral channel having an open end which opens out into said pipe, and a median channel which is parallel to said transverse plane of symmetry and symmetrically located with respect thereto, said median channel having an open end which opens out into said pipe; said two auxiliary sources which constitute the dipole being located across said chamber, symmetrically with respect to said transverse plane of symmetry and said auxiliary source which constitutes the unipole being located in said median channel, symmetrically with respect to said transverse plane of symmetry.

4,177,875

MUFFLER FOR INTERNAL COMBUSTION ENGINE

Takao Kurobe; Katsuziro Tachikawa; Tetsuo Kato, and Yoshinobu Imatoku, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha; Kabushiki Kaisha Sango and Futaba Sangyo Kabushiki Kaisha, all of Aichi, Japan

Filed Jan. 4, 1978, Ser. No. 866,828
Claims priority, application Japan, Aug. 15, 1977, 52/97020
Int. Cl.[2] F01N 1/08
U.S. Cl. 181—265 2 Claims



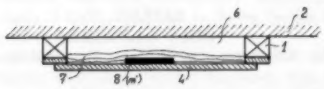
1. A muffler assembly for an internal combustion engine comprising: a generally cylindrical casing having a pair of end plates closing the interior of said casing and a central axis extending longitudinally thereof; a baffle plate located intermediate said end plates and extending across the interior of said casing in a plane generally perpendicular to said central axis; a front chamber defined between one of said end plates and said baffle plate; a tuning chamber defined between the other of said end plates and said baffle plate; an exhaust gas inlet extending through said one end plate in a direction generally parallel to said central axis, said inlet pipe being in direct flow communication between the exterior of said casing and said front chamber to deliver exhaust gases into said front chamber; an exhaust gas outlet pipe extending through said one end plate through which said inlet pipe extends in a direction parallel to said inlet pipe, said outlet pipe being in direct flow communication between said front chamber and the exterior of said casing to discharge exhaust gases from said front chamber; first tuning means consisting essentially of a tuning tube extending through said baffle plate in direct flow communication between said front chamber and said tuning chamber, said tuning tube being in direct coaxial alignment with said inlet pipe across said front chamber and extending generally parallel to said central axis; and second tuning means defining a gas flow path extending through said baffle plate between said tuning chamber and said front chamber, and gas flow path being in direct coaxial alignment with said outlet pipe across said front chamber.

4,177,876

PREFABRICATED ELEMENT TO FORM A DOUBLE SOUND INSULATION AND ABSORPTION WALL OF A DWELLING

Jean Pujolle, Paris, France, assignor to Telediffusion de France, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,717
Claims priority, application France, Sep. 10, 1976, 76 27280
Int. Cl.[2] E04B 1/82
U.S. Cl. 181—284 4 Claims



1. A sound absorbing and sound insulating structure wherein a single wall of a room having an annoying natural resonant frequency is covered with a plurality of prefabricated structures, each prefabricated structure comprising:

a four sided frame having parallel cross members for attachment to the wall, said cross members each having a height d to space a flexible panel member attached to said frame by said distance d from said wall;

a flexible panel member adhesively secured to said cross member at said distance d from said wall having a surface mass much smaller than the surface mass of said wall;

an additional surface mass adjustment element fixed to the side of said panel member which is inside the air space between the panel member and said wall; said additional adjustment element serving as the sole means for adjusting the surface mass of the structure so that the resonant frequency of the panel supporting said additional element is equal to a natural resonant frequency of said room after installation;

an elastic adhesive bonding said flexible panel member to said cross member;

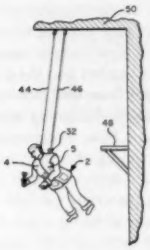
the flexible panel members being of at least two different resonant frequencies due to differences in their surface mass, these differences taking into account the masses of the additional elements whereby each prefabricated structure and adjacent panel member on a wall has a different resonant frequency to provide an array of at least two flexible panel assemblies at a common distance d from the wall.

4,177,877

SAFETY VEST

Albert A. Gallinati, 820 E. McKinley St., Mundelein, Ill. 60060

Filed Feb. 21, 1978, Ser. No. 879,783
Int. Cl.[2] A62B *35/00*
U.S. Cl. 182—3 **10 Claims**



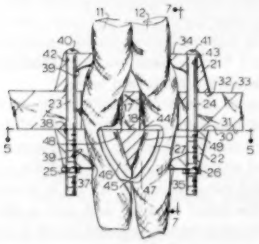
1. A safety garment having an inner and an outer shell, and a yieldable and slidable strap assembly within the shells including front and rear portions adapted to pass behind the user's back and chest respectively, and a circumferentially extending belt section adapted to extend about the waist of the user, said front and rear portions having lower ends overlapping the belt section, means connecting said lower ends of the strap portions to adjacent portions of the belt section, said front and rear portions having upper ends joined to form loops, tether means connected to the loops, and means foreshortening the effective lengths of said rear portions of the strap assembly and disposed in an area of the garment on the back side thereof intermediate said belt section and the upper portion of the garment and abuttable with each other upon tensioning said belt assembly through said loops.

4,177,878

ROPE LADDER

Robert M. Salvarezza, 110 Braemar Dr., Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 901,785, May 1, 1978. This application Aug. 14, 1978, Ser. No. 933,645
Int. Cl.[2] E06C *1/56, 7/50*
U.S. Cl. 182—199 **12 Claims**



1. A rope ladder, including in combination:

(a) a series of ladder steps, each with an upper surface and a lower surface, two longitudinal edges and two end edges, each step having two spaced-apart pairs of vertical through openings, one pair spaced in from each said transverse edge, the openings in each pair being spaced apart from each other,

(b) two spaced-apart pairs of ropes, each rope passing through one said through opening of each said step,

(c) two pairs of wedge collars for each said step, one pair at each end of said step with an upper said wedge collar above its step and a lower said wedge collar below its step, each said wedge collar having a step-engaging end and a distal end and a single elongated through opening through which one pair of ropes pass and which at said step-engaging end is at least as wide as the overall distance between and including said step's through openings, said elongated through opening of at least said lower wedge collar curving inwardly from said step-engaging end to a narrower portion of said elongated opening at the distal end that is barely wide enough for the two ropes to pass therethrough,

said pair of wedge collars having an elongated pair of vertical bolt passages through them,

(d) a wedge heart in between said ropes of each pair of ropes and in each said elongated through opening of said lower wedge collar, said wedge heart having an upper surface in engagement with said lower surface of said step and tapering downwardly to an apex at its lower end and providing two rope-engaging side surfaces ending at said apex, which at said upper surface are spaced apart a distance identical to the distance between said step's through openings, so that these rope-engaging surfaces, when said wedge heart is fully wedged to place, lock their pair of ropes in place and prevent relative movement between them and said lower wedge collar and wedge heart, and

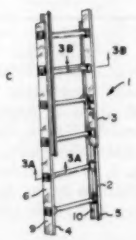
(e) a pair of bolts, each with a nut, for each pair of wedge collars, to wedge said wedge heart and lock said ropes in fixed position relative to said wedge heart and said pair of wedge collars and therefore to the step between the wedge collars.

4,177,879

LADDER AND METHOD OF CONSTRUCTION THEREFOR

William H. Frank, Louisville, Ky., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 25, 1977, Ser. No. 818,590
Int. Cl.[2] E06C *7/08, 7/50*
U.S. Cl. 182—220 **5 Claims**



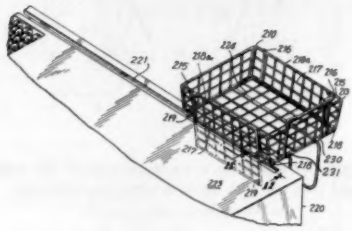
1. In a ladder having two elongated side rails each with a web, said web having two broad surfaces with spaced holes, said spaced holes including a large, central rung receiving hole in it, and smaller holes spaced outwardly from said central hole, and rungs supported by and extending between the webs of said side rails at spaced locations, the improvement comprising a rung bracket molded in place on said web having on one side of said web a hollow, rung receiving boss and a base part, and on another side of said web, a pad part, said pad and base parts covering all of said small holes, and tying members integral with the base and pad parts connecting said parts and extending through said holes in said web, said tying members of said bracket extending through all of said smaller holes and defining ribs extending from said base part to said boss, individual ones of said ribs being at least in part congruent with individual ones of said smaller holes so that said bracket is moldable in place on said web from a single side of said web.

4,177,880

COMBINATION SUPERMARKET COUNTER AND CART THEREFOR

Stanley Joseloff, 185 S. Atlantic Ave., Cocoa Beach, Fla. 32931

Division of Ser. No. 836,031, Sep. 23, 1977, Pat. No. 4,114,727.
This application Aug. 7, 1978, Ser. No. 939,635
Int. Cl.[2] A47F *9/02*
U.S. Cl. 186—1 R **3 Claims**



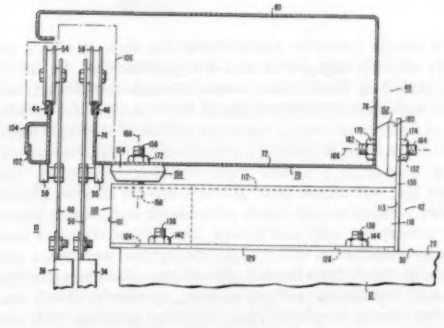
1. In combination, an improved check-out counter and shopping cart cooperating therewith; said counter construction including an upper surface having an elongated slot therein, extending between upstream and downstream areas adjacent a longitudinal edge thereof; said cart including a wheeled frame element and a basket element supported by said frame element and including front, rear, and a pair of side walls; at least one of said side walls having a portion thereof arranged for substantially vertical sliding movement between open and closed positions; said cart being selectively positioned with said basket element overlying said upper surface of said counter, wherein said slidably mounted portion of said side wall in open position penetrates said slot for horizontal sliding movement therein.

4,177,881

ELEVATOR SYSTEM

George A. Kappenhagen, Mechanicsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 833,626, Sep. 15, 1977, Pat. No. 4,149,615.
This application May 30, 1978, Ser. No. 910,812
Int. Cl.[2] B66B *13/08*
U.S. Cl. 187—56 **1 Claim**



1. An elevator system, comprising:

an elevator car having front and top portions, with the front portion defining an entranceway,

door operator means having an elongated base frame member, said base frame member having first and second ends and a front portion,

means mounting said door operator means on the top portion of said elevator car, with the front portion of the base frame member being adjacent to the front portion of the elevator car,

said front portion of the base frame member including a first hanger roller track which overhangs the front portion of the elevator car,

a second hanger roller track, said second hanger roller track being an elongated, tubular structure having first and second ends and an upstanding leg portion which extends in a direction between its ends to define the hanger roller track,

mounting means mounting said second hanger roller track to said base frame member in horizontally spaced relation relative to said first hanger roller track, with the space between them having a predetermined length dimension along the front portion of the elevator car which is accessible from above,

first and second hanger plates each having hanger rollers mounted thereon, said first and second hanger plates being disposed between said spaced first and second hanger roller tracks, with their associated hanger rollers engaging the first and second hanger roller tracks, respectively,

first and second door panels for the entranceway of said elevator car,

means fastening said first and second door panels to said first and second hanger plates, respectively,

and means connecting said door operator means to said first and second hanger plates,

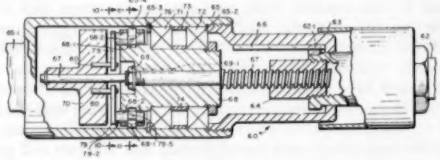
said tubular structure of the second hanger roller track, and said mounting means therefor, supporting the associated hanger plate and door panel such that the predetermined space between the first and second hanger roller tracks which is accessible from above is free of mounting means for a dimension sufficient to enable the first and second hanger plates and associated door panels to be removed from the hanger roller tracks from above.

4,177,882

MECHANICAL SNUBBING DEVICE WITH INERTIA ACTUATED BRAKING MEANS

Terrence P. Dowell, Van Nuys, and Edwin L. Banks, Jr., Lakeview Ter., both of Calif., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Mar. 7, 1977, Ser. No. 775,260
Claims priority, application United Kingdom, Apr. 8, 1976, 14312/76
Int. Cl.[2] F16F *7/10*
U.S. Cl. 188—1 B **9 Claims**



1. In a snubber, first and second concentrically arranged parts slidingly interengaged for relative movement with a portion of one part extending into the other, a nut fixed to one part, a driver rotatably mounted within the other part and a screw fixed at one end to the driver and rotatably engaged at its other end within the nut, a braking surface on the other part concentric with the axis of the screw, brake shoes mounted to the driver within and concentric to the braking surface having portions for engaging the braking surface, said driver being driven in rotation by the screw, an inertia mass positioned about the screw for free rotation, said brake shoes being supported by the driver for sliding radial motion and being rotated by the driver, a plurality of levers pivotally supported by the driver and coupled to said inertia mass, said levers including cam means having cam portions supported for rotation by said driver, slidingly engaged with the ends of the brake shoes, each camming portion including means for rotating the brake shoes about a portion of the heel end of another of the cam portions

and a slot in the driver within which the brake shoes are confined for sliding motion.

4,177,883

DISCS FOR DISC BRAKES

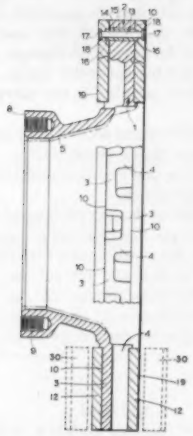
Hugh G. Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 30, 1977, Ser. No. 856,205

Claims priority, application United Kingdom, Dec. 11, 1976, 51786/76

Int. Cl.[2] F16D *65/12*

U.S. Cl. 188—218 XL **7 Claims**



1. A disc for a disc brake comprising a driving component for connection to a rotatable member to be braked, said driving component comprising a cast mounting having flat opposite discontinuous abutment faces, annular braking members carried from said abutment faces, each of said braking members comprising a flat ring having a first face for direct intimate contact over a substantial area with a respective one of said abutment faces and a second opposite face for engagement by at least one friction member, and angularly spaced rivets additional to and separate from said annular members and said mounting for clamping said annular members against said abutment faces to maintain said direct intimate contact therebetween, wherein said angularly spaced rivets are circular in section and have heads, recessed openings are provided in said second faces of said annular members for receiving said heads, and openings are provided in portions of said driving component through which said rivets project, and wherein roll pins pass through said openings in said driving component and have opposite ends which are received in recesses in said first faces of said annular members, said roll pins having plain cylindrical bores through which said rivets project.

4,177,884

DAMPING MECHANISMS

William P. Vinten, Hartest, England, assignor to W. Vinten Limited, Suffolk, England

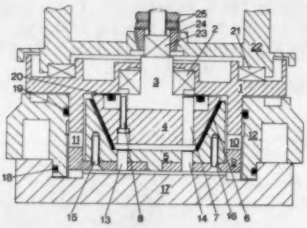
Filed Jun. 2, 1978, Ser. No. 911,875

Claims priority, application United Kingdom, Sep. 8, 1977, 37485/77

Int. Cl.[2] F16F *15/20*

U.S. Cl. 188—290 **6 Claims**

1. A damping mechanism comprising at least a pair of mateable surfaces, one of said surfaces being substantially resistive to lubricants, the other of said surfaces being substantially absorbent of lubricants, said surfaces being in engagement, and means for varying the pressure of one of said surfaces on the other of said surfaces to vary the degree of drag so that when said two surfaces are moved in the same plane relative to each



other the degree of damping is proportional to the relative velocity of said two surfaces up to a whip pan velocity.

4,177,885

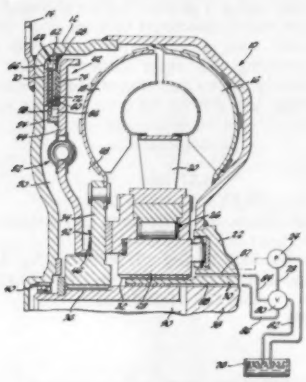
TORQUE CONVERTER AND LOCK-UP CLUTCH

Phillip J. Ross, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1978, Ser. No. 951,090

Int. Cl.[2] F16D *47/06*

U.S. Cl. 192—3.3 **2 Claims**



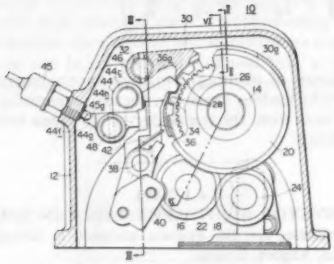
1. A torque converter and multiple disc lock-up clutch assembly wherein engagement and disengagement of the clutch is controlled by fluid flow reversal through the torque converter, said assembly comprising; an input shell; a first annular splined member secured to the inner surface of said input shell; a clutch plate piston drivingly connected to the turbine of said torque converter; a clutch apply chamber formed by said turbine and said clutch plate piston; a second annular splined member secured to said clutch plate piston and being substantially concentric with and having lesser outer diameter than the inner diameter of said first annular splined member; a pair of annular clutch discs having splined outer diameters meshing with said first annular splined member; an annular clutch friction disc having a splined inner diameter meshing with said second annular splined member and being disposed intermediate and in controllable friction drive relation with said pair of annular clutch discs; an annular friction surface secured to said clutch plate piston adjacent to and in controlled friction drive relation with one of said pair of annular clutch discs and axially spaced from said annular clutch friction disc by said one annular clutch disc; and means for supplying fluid to said clutch apply chamber so that the clutch plate piston can be pressurized to enforce a friction drive in the clutch assembly between said annular clutch discs and said annular clutch friction disc and said annular friction surface.

4,177,886

PARKING BRAKE MECHANISM FOR MOTOR VEHICLE EQUIPPED WITH POWER TRANSMISSION WITH TORQUE CONVERTER

Kazuyoshi Hiraiwa, Ome, and Kotei Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 26, 1977, Ser. No. 819,167
Claims priority, application Japan, Jul. 27, 1976, 51-89473
Int. Cl.[2] B60K *29/02*
U.S. Cl. 192—4 A 11 Claims



1. A parking brake mechanism for a motor vehicle transmission having a transmission output shaft, a hub fixedly mounted on said output shaft, and an output shaft gear rotatable about said output shaft, said mechanism comprising:

a coupling sleeve coaxially slidably mounted around said hub and engageable with both said hub and said output shaft gear to provide secure connection between said output shaft gear and said output shaft, said sleeve being formed at its periphery with a plurality of external teeth having gaps therebetween;

a brake pawl mounted to rotate about an axis parallel with the axis of said output shaft, said brake pawl carrying a tooth which engages with one of the gaps formed between adjacent teeth of said sleeve when said brake pawl is biased to swing toward said coupling sleeve; and

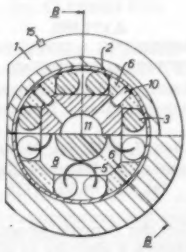
a parking cam for urging said brake pawl to swing toward the teeth of said coupling sleeve, said parking cam biasing said brake pawl into engagement with the teeth of said coupling sleeve when said vehicle transmission is shifted into a parking position.

4,177,887

REVERSE SELF-LOCKING DEVICE

Harry Kellett, Dalton-in-Furness, and Harold L. Searle, Barrow-in-Furness, both of England, assignors to Vickers Limited, London, England

Filed Aug. 15, 1977, Ser. No. 824,604
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—8 R 3 Claims



1. A drive transmitting device for use with a gun, which device may be preset and which will subsequently become locked if sudden or gradual rotation forces are applied, said device comprising:

a first member;

a second member, at least part of said first member being inside said second member;

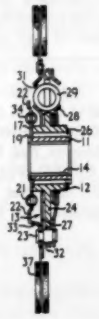
means interposed between said first and second members whereby rotation of one of said members in either direction about a first axis of rotation causes rotation of said other member about said axis in the same direction as said one member, and whereby rotation of said one member about said first axis from its preset position as a result of rotation of said other member in either direction about said first axis is prevented, said means including a cylindrical housing coaxial with said first axis and extending around said second member, a plurality of rollers each having an axis of rotation spaced from said first axis and being arranged in respective pairs around said first axis, the number of pairs of rollers being more than two, spring means biasing the rollers of each pair of rollers away from each other, said spring means engaging with each of said rollers as close as possible to their axes of rotation and allowing free rolling movement of each of said rollers, said spring means comprising a separate spring for each said pair of rollers, each spring comprising a U-shaped resilient body extending radially inwardly from a respective pair of said rollers and having end portions which extend axially into central bores of said respective pair of rollers, wedging surfaces for said rollers defined by a flat outer surface on said first member for each respective pair of rollers and an internal cylindrical surface of said housing, said rollers cooperating with said wedging surfaces to prevent rotation of said one member from its preset position about said first axis as a result of rotation of said other member in either direction about said first axis, the forces required to restrain rotation of said one member being shared substantially equally between respective rollers of each of said pairs.

4,177,888

FRICTION CLUTCH PLATE WITH TWO CONCENTRIC HUBS FOR DAMPING

David R. Arrowsmith, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Dec. 12, 1977, Ser. No. 859,853
Claims priority, application United Kingdom, Jan. 4, 1977, 00014/77
Int. Cl.[2] F16D *3/14*
U.S. Cl. 192—106.2 18 Claims



1. A friction clutch driven plate comprising:

a first hub member;

a second hub member concentric with the first hub member and capable of limited angular movement about the hub axis relative to the first hub member;

a friction facing carrier mounted on the second hub member

by means allowing restrained limited angular movement about the hub axis relative to the second hub member;

springs seatings located on the first hub member and the carrier such that the first hub member seatings and the carrier seatings lie in a common radial plane;

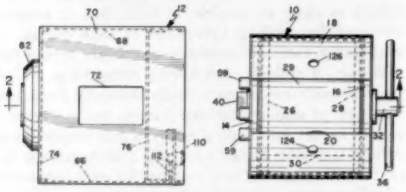
and springs acting between the first hub member seatings and the carrier seatings so as to restrain the relative movement between the first hub member and second hub members.

4,177,889

MONEY BOX AND VAULT

Ralph D. Adams, Escondido, and James K. Wyckoff, San Diego, both of Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Jan. 19, 1978, Ser. No. 870,715
Int. Cl.[2] G07B *15/00*
U.S. Cl. 194—1 B **12 Claims**



1. A coin box assembly for use in combination with a coin operated machine, said box comprising:

an outer cylindrical housing having co-axial bores formed in the end walls thereof and a coin opening in the side wall thereof;

an inner cylindrical housing mounted within said outer housing and having co-axial journal means journaled within said co-axial bores for relative rotation therein and a coin opening in the side wall thereof for alignment with said opening in said outer housing for the passage of coins therethrough;

lock means for locking said inner and outer housings into a locked position against relative rotation with said openings out in alignment, said lock means comprises a plurality of bores formed in adjacent walls of said inner and said outer housing, and spring biased pin means disposed in said bores and normally extending between and locking said walls against relative rotation,

a vault housing having a chamber for receiving said box, and means in said chamber for simultaneously locking said box in said chamber and unlocking said inner and said outer cylindrical housings for permitting relative rotation therebetween for alignment of said coin openings.

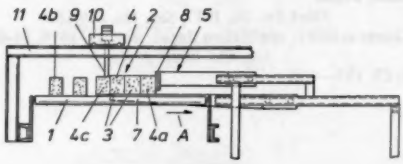
4,177,890

DEVICE FOR THE FORMATION OF SEPARATED ROWS OF GREEN BRICKS

Horst Steingrover, Ibbenbueren, Fed. Rep. of Germany, assignor to C. Keller GmbH u. Co. KG, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,244
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730428
Int. Cl.[2] B65G *47/30*
U.S. Cl. 198—434 **3 Claims**

1. Apparatus for separating green bricks of the type which tend to stick together when abutting one another, said green bricks being arranged in a compact array of abutting crossrows, comprising a base receiving the separated green bricks, a lifting means operable to hold the compact array above said base and to be moved laterally relative to said base as leading crossrows are sequentially deposited from the lifting means onto the base, and separating means disposed over said base, said separating means comprising a separating member movable upwardly and downwardly, said separating member being movable downwardly toward the compact array of green bricks to engage the leading crossrow to thereby hold the engaged leading crossrow on said base as the remainder of the



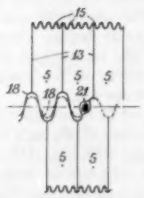
compact array of abutting crossrows moves laterally away from the held leading crossrow, thereby separating the held individual row from the remainder of the green bricks in the compact array.

4,177,891

CONVEYOR BELT DEFORMABLE IN SPACE

Gilbert Delfosse, Avrille, France, assignor to Braud, Société Anonyme, Angers, France

Filed Aug. 2, 1978, Ser. No. 930,401
Claims priority, application France, Aug. 12, 1977, 77 24846
Int. Cl.[2] B65G *17/36*; A01D *61/00*
U.S. Cl. 198—570 **4 Claims**



1. An assembly of conveying elements comprising two adjacent and synchronized bands each having a first end wall imbricated in those of the other band so as to constitute a double width conveyor capable of clearing obstacles inserted between the two bands; said bands being flexible and corrugated to form therein a series of alternating hollow portions and projecting portions, each of said bands being secured at spaced intervals to a longitudinally non-extensible traction member capable of being put out of shape in at least one direction perpendicular to its length, wherein the hollow portions of each band form a series of bucketlike elements which are closed along a first edge of each band by said first end walls, said first end walls having substantially identical dimensions and shape.

4,177,892

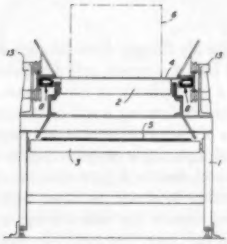
CONVEYOR COMPRISING A DRIVEN FLEXIBLE BELT FOR STEPWISE ADVANCING MOULDS

Emil Jespersen, Glostrup, and Vagn Mogensen, Gentofte, both of Denmark, assignors to Dansk Industri Syndikat AS, Herlev, Denmark

Filed Jun. 7, 1977, Ser. No. 804,367
Claims priority, application Denmark, Sep. 24, 1976, 4327/76
Int. Cl.[2] B65G *23/38*
U.S. Cl. 198—832 **2 Claims**

1. A conveyor for the stepwise advance of a plurality of casting moulds including a plurality of aligned closely juxtaposed mould parts having pouring cavities at joint faces between successive mould parts, comprising a frame, a flexible mould supporting belt carried by said frame so as to be mov-

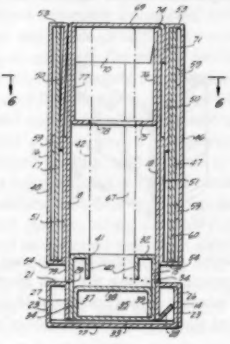
able in its longitudinal direction, and a driving mechanism to impart a stepwise longitudinal movement to said belt, said driving mechanism including a pair of elongate and substantially nonextensible coupling parts extending reciprocably along the opposite side edges of said belt and each comprising means selectively to clamp the respective coupling parts to the respective side edge portions of the belt over a substantial length thereof, and to release the coupling parts from said side edge portions, said coupling parts including, longitudinally extending parallel brackets disposed along corresponding portions of opposite sides of said frame, two sets of rollers rotatably supported by each said bracket with the axes of each set coplanar with each other and also the corresponding set on the other said bracket, the planes of said sets of rollers respectively being above and below the plane of said belt, a web plate movably mounted between said sets of rollers on each bracket



for reciprocation longitudinally of said belt, a first flange rail rigidly supported by each web plate and extending in parallel overlying relation with the adjacent longitudinal edge portion of said belt, a second flange rail rigidly supported by each web plate parallel with said first flange rail and belt and underlying the adjacent longitudinal edge portion of said belt the surface of one of said flange rails adjacent said belt being substantially level with the adjacent surface of said belt, an expansible means carried by said other flange rail between said rail and the adjacent surface of said belt and extending longitudinally of said rail, and a clamping rail carried by said expansible means for movement into and from engagement with the adjacent surface of said belt according to the expansion of said expansible means, whereby said belt is firmly clamped along its opposite edges uniformly along the full length of said clamping rails to retain said belt in a firm, flat condition as the belt with the moulds thereon is advanced by said clamping rails.

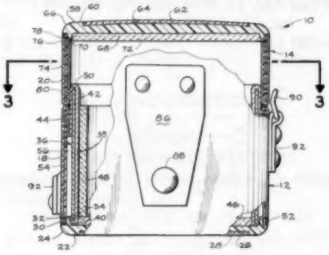
4,177,893
MERCHANDISE CONTAINER
William F. Kornfeld, 34 Shepherd La., Roslyn Heights, N.Y. 11577
Filed Nov. 27, 1978, Ser. No. 964,114
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **8 Claims**

1. A merchandise container, comprising:
(a) a box-like base formed of a single piece of paperboard, the top wall of said base having an opening,
(b) a box-like insert, formed of a single piece of paperboard, within the opening in said base top wall, said insert projecting above said base top wall and having dimensions in a horizontal plane smaller than the corresponding dimensions of said base, so that said base and insert together have a stepped configuration, and said insert having an opening in its top wall for accommodating an article of merchandise,
(c) a double walled shell formed of a single piece of paperboard, at least one end of said shell being open, and
(d) a liner, formed of a single piece of paperboard, within said shell, said liner projecting downwardly beneath the bottom edge of said shell and sized and shaped to fit



snugly around the portion of said insert projecting above said base.

4,177,894
LENS CASE
Steven D. Petersen, 5316 Lewis Rd., Agoura, Calif. 91301
Filed Jul. 11, 1978, Ser. No. 923,705
Int. Cl.[2] B65D *85/38*
U.S. Cl. 206—316 **11 Claims**

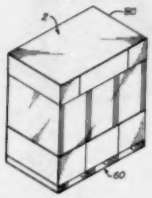


1. A lens case comprising:
a pair of tubular body members, each having a first open end, and an opposite end closed by an end-encompassing member attached thereto, said body members being coaxially disposed when said case is closed;
padding material disposed within said body members and against said end members;
hinge means connecting said body members; and
latch means affixed to one said body member and releasably attached to the other.

4,177,895
MOISTURE STABILIZED PACKAGE
Marcus H. Shelton, 613 Morrell, Baytown, Tex. 77520
Division of Ser. No. 487,895, Jul. 12, 1974, Pat. No. 4,095,692.
This application May 23, 1978, Ser. No. 908,870
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[2] B65D *19/02*
U.S. Cl. 206—386 **12 Claims**

1. An improved-strength-retaining moisture-stabilized package comprising in combination a container prepared from corrugated standard paperboard having peaks and flutes said container having four side walls, a closed bottom and an open top with a polymeric covering encompassing said four walled exterior surfaces and the exterior of said bottom portion of said container, and a water vapor permeable cover for covering

said top open portion of said container said cover being prepared from standard paperboard having high porosity whereby said cover permits water vapor to be displaced upwardly from the interior of said container to pass through said cover and said polymeric covering prevents air currents from passing through the interior of said container, thereby resulting in a moisture-constant state within the interior of said package.



4,177,896

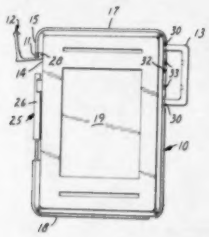
RECESSED HOOK AND HANDLE FOR A PLASTIC BOX

Mark W. Weavers, Little Canada, and Anthony W. Konkler, Lakeland, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1978, Ser. No. 896,586

Int. Cl.[2] B65D *85/67, 23/10*

U.S. Cl. 206—387 **4 Claims**



1. In a plastic box adapted for storage and shipment of a tape cassette, said box having rectangularly disposed first and second edge walls, first and second end walls, and opposed side walls, the improvement wherein said box has:

a recess opening through said side walls and said first edge wall adjacent said first end wall;

a hook portion projecting over a portion of said recess toward said second end wall so that the hook can be engaged with a horizontal member by passing the hook transversely over the horizontal member with the horizontal member being received in a position extending through said recess;

a handle portion adapted for manual engagement and integrally formed with said second edge wall adjacent said first end wall, said handle portion being thin and flexible at its juncture with said second edge wall to afford movement of said handle portion between a carrying position projecting from said second edge wall, and a storage position with said handle member generally parallel with said second edge wall;

a recess adapted to receive said handle member in its storage position; and

means for releasably retaining said handle portion in its storage position.

4,177,897

WOUND ROLL OF FIBROUS MATERIAL

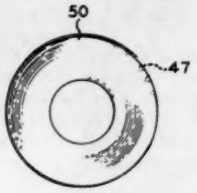
Terrell A. Cole, 2820 Sherwood Dr., San Bruno, Calif. 94066

Division of Ser. No. 700,012, Jun. 25, 1976, Pat. No. 4,097,983.

This application May 11, 1978, Ser. No. 904,975

Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—389 **1 Claim**



1. A length of single ply fibrous material such as label ribbon and the like wound into a coreless roll comprising: a fibrous ribbon wound into a multiplicity of contiguous, radially successive, concentric layers forming a roll of an annular configuration consisting of a plurality of inner layers disposed near the center of the roll and a plurality of outer layers disposed near the periphery of the roll, first locking means for establishing an interlocking relationship between the inner layers of the roll, and a second locking means for establishing an interlocking relationship between the outer layers of the roll, each of said locking means comprising a plurality of punctures and a plurality of burrs, each puncture of said plurality of punctures being formed in a layer of a plurality of radially successive layers of the roll and disposed in registry with adjacent punctures, and each burr of said plurality of burrs being integrally related to and projected from a layer of said plurality of radially successive layers of the roll and received in an interlocking relationship with a plurality of said punctures.

4,177,898

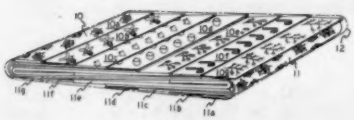
GIFT WRAP PACKAGE

Robert J. Humphrey, Bennington, Vt., assignor to Avco Corporation, Greenwich, Conn.

Filed Aug. 28, 1978, Ser. No. 937,651

Int. Cl.[2] B65D *69/00*

U.S. Cl. 206—494 **3 Claims**



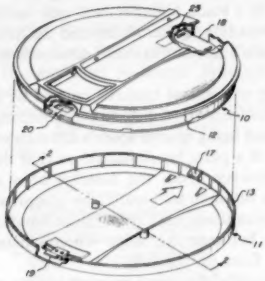
1. In a gift wrap package having first and second identical nests of a plurality of folds of gift wrap sheets, each fold comprising at least two sheets of gift wrap, the sides of the sheets in each of said folds being aligned widthwise, said folds being folded on at least one Y axis parallel to the sides, the improvement comprising:

the ends of said sheets in each fold being misaligned lengthwise so that an end portion of each sheet in each fold is visible, each of said folds being folded on an X axis transverse to the sides to provide a front panel and a rear panel, whereby a portion of each sheet of said fold is visible within said front panel, said folds being nested within one another with the Y axis of all the folds being aligned, the front panel of the innermost folds being longer than the front panels of the outermost folds, whereby all of said end portions of said front panels are visible.

4,177,899
DISC MEMORY MODULE WITH STACKABLE DUST SHIELD

Paul N. Green, and James A. Duff, both of Omaha, Nebr., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 5, 1978, Ser. No. 939,514
Int. Cl.[2] B65D *55/00*
U.S. Cl. 206—509 1 Claim

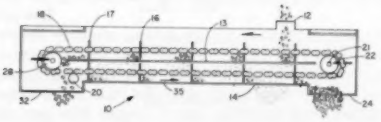


1. A dust shield to be detached and attached to a disk memory module of the type having a permanent housing having an aperture permitting access to the disk within by a drive unit, and a dust shield mating surface encircling the aperture, said dust shield having a mating surface mating with the permanent housing mating surface when attached to the module, wherein the improvement comprises a stacking surface on the dust shield similar to the mating surface on the permanent housing and spaced from the mating surface of the dust shield, and including a ridge extending around at least a substantial percentage of the periphery of the dust shield and dimensioned so as to mate with the mating surface of a similar dust shield, whereby a plurality of dust shields may be nestingly stacked with each other by the mating of the ridge with the dust shield mating surface.

4,177,900
GRAIN SCALPING AND CLEANING APPARATUS AND METHOD

Eldon R. Kluthe, Cairo, Nebr. 68824

Filed Jul. 31, 1978, Ser. No. 929,481
Int. Cl.[2] B07B *1/04*
U.S. Cl. 209—247 27 Claims



1. A method of scalping and cleaning grain wherein a rough grain product is processed into an intermediate grain product and then into a finished grain product, said rough grain product being comprised of a multitude of grain particles, a multitude of large impurities and a multitude of small impurities, said large impurities being of a larger diameter than said grain particles and said grain particles being of a larger diameter than said small impurities, said intermediate grain product being comprised of said grain particles and said small impurities, and said finished grain product being comprised of said grain particles, comprising the steps of:

(a) placing said rough grain product on an overs screen having a multitude of first openings, said first openings having a diameter which is larger than said grain particles and said small impurities, but smaller than said large impurities;

(B) moving said rough grain product relative to said overs screen by the use of a grain movement means, said grain movement means including a driving means driveably connected to a first end and a second end and grain movement members driveably connected to said first end and said second end, each of said grain movement members comprising an elongate flat paddle having a first elongate edge and a second elongate edge opposite said first elongate edge, said first elongate edge including a plurality of notches, said notched paddles consisting of a number of first notched paddles and a complimentary number of second notched paddles, said notches of said first notched paddles not being aligned with said notches of said second notched paddles, said first notched paddles and said second notched paddles being driveably connected to said first end and said second end in an alternating manner so that said first notched paddles pass over said overs screen immediately in front of and immediately behind said second notched paddles and said second notched paddles pass over said overs screen immediately in front of and immediately behind said first notched paddles;

(c) allowing said grain particles and said small impurities to fall through said first openings of said overs screen and fall against an unders screen having a multitude of openings of a smaller diameter than said grain particles but of a larger diameter than said small impurities;

(d) moving said small impurities and said grain particles, comprising said intermediate grain product relative to said unders screen by the use of said second elongate edges of said first and second notch paddles, said elongate edges being solid straight edges;

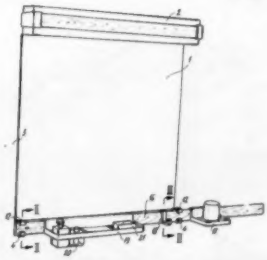
(e) allowing said small impurities to fall through said unders screen;

(f) removing said grain particles comprising a finished grain product through a finished grain product discharge means.

4,177,901
BATHROOM WALL FIXTURE

Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation, Grenoble, France

Filed Apr. 18, 1978, Ser. No. 897,423
Claims priority, application France, Apr. 19, 1977, 77 12642
Int. Cl.[2] F16M *13/00*
U.S. Cl. 211—105.1 10 Claims



1. A bathroom wall fixture comprising:

a mirror;

a pair of like supports each having a seat engaging and supporting said mirror;

a generally horizontally extending bar carried on said supports and horizontally and longitudinally displaceable thereon with respect to said mirror;

means on each of said supports tightenable for securing same to said bar and thereby fixedly positioning said bar relative to said mirror; and

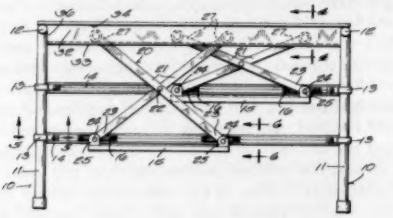
at least one shelf acccessory supported on and horizontally slidable along said bar.

4,177,902

DISPLAY UNIT

Ronald R. Winn, 430 Ridge Ave., Galesville, Wis. 54630

Filed May 2, 1978, Ser. No. 902,025
Int. Cl.[2] A44F *5/10*
U.S. Cl. 211—162 **4 Claims**



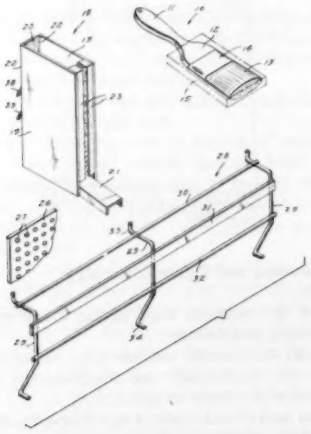
1. In an article display rack having a top, bottom, front, back, and left and right sides, a plurality of vertical bottom channels extending from left to right and slidable from front to back, a plurality of panels one above each channel slidable from left to right, a pair of front to back arms spaced or placed at the left side and the right side respectively of said channels, each said track being provided at each end with a clamping member to secure it to said fore and aft rod in any fore and aft adjusted position, an upper track comprising a vertically opening channel for each said panel, each panel being provided at its bottom with a plurality of wheels immediately adjacent the plane of the panel at the bottom only, and each said panel being provided with a scissors linkage at the top, each arm of the scissors linkage having a pivotal attachment to the panel at one end, a pivotal attachment to the other arm of the scissors at its center, and a panel aligning roller at its rearmost end, and the channel for each said roller having a depending flange to trap the roller in the track.

4,177,903

PAINT BRUSH MERCHANDISING DISPLAY

Stanley Edelson, Searingtown, and Samuel Feinberg, Long Beach, both of N.Y., assignors to Amsterdam Brush Company, Amsterdam, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,793
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—49 D **6 Claims**



1. A modular merchandising display for paint brushes having a variety of sizes, the display comprising:

I. at least several modules all of which are identical to each other, each module being adapted to hold a stack of paint brushes and including:

(a) two vertical side walls permanently joined together at a fixed horizontal spacing, the spacing being larger than the width of the handles of a variety of sizes of paint brushes but smaller than the width of the bristle portions of the variety of sizes of paint brushes,

(b) a bottom wall, between said side walls near the lower edges of the latter, for supporting the lowermost paint brush in a stack between said side walls, said bottom wall extending forwardly beyond the front edges of said side walls and being inclined downwardly from back to front,

(c) a strip of resilient material carried by each side wall along its front edge, said strips projecting toward each other and being spaced apart a distance smaller than the width of a paint brush handle so that they frictionally grip between them the handles of a stack of paint brushes between said walls, the compressability of said strips permitting each paint brush handle to move outwardly between the strips when a paint brush is removed from the module,

II. a horizontally elongated support having a length many times the width of one of said modules, and

III. mounting means carried by each of said modules and projecting beyond the external contours of its respective module for securing the module to said support at any point along the length of said support,

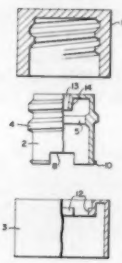
whereby said modules may be mounted with any desired spacing between them.

4,177,904

SEAL ASSEMBLY FOR BOTTLES OR FLASKS

Antonio Puig Planas, No. 7 Juan Sebastian Bach St., Barcelona, Spain

Filed Jul. 24, 1978, Ser. No. 927,041
Claims priority, application Spain, Oct. 10, 1977, 231,303
Int. Cl.[2] B65D *41/08*
U.S. Cl. 215—12 R **9 Claims**



1. A seal assembly for bottles or flasks, said seal assembly comprising:

a neck member having a generally elongated hollow configuration adapted to non-rotatably fit about the exterior of a bottle or flask, said neck member having an upper end and an integral radially inwardly and longitudinally downwardly extending wall, said wall having at least one inwardly extending projection;

a generally hollow cylindrical intermediate member including means cooperating with said neck member to prevent relative rotation therebetween, said intermediate member having on the interior thereof means cooperable with a neck of the bottle or flask to prevent relative longitudinal movement therebetween, said intermediate member having an upper end having therein a dispensing opening adapted to align and cooperate with an opening in the

neck of the bottle or flask to dispense product therefrom; and

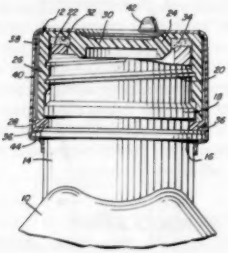
a stopper member having a closed upper end and an open lower end, said stopper member having means cooperating with said intermediate member for removably attaching said stopper member to said intermediate member such that said closed upper end of said stopper member blocks said dispensing opening of said intermediate member.

4,177,905

CLOSURE SYSTEM FOR CONTAINERS

David A. Winchell, Twin Lakes, Wis., and Thomas A. Fowles, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 5, 1978, Ser. No. 912,670
Int. Cl.[2] B65D *41/54*
U.S. Cl. 215—246 **20 Claims**



1. A closure system for a container having a neck with a cap support flange extending radially outwardly from the neck, the top of the neck comprising a pour lip, the neck having threads above the support flange for engaging cooperating threads carried by a closure cap, the improvement comprising, in combination:

a closure cap comprising a top portion and an annular skirt depending downwardly therefrom;

said closure cap carrying threads adapted to cooperate with the container neck threads to enable axial travel of the cap with respect to the container neck when the cap is rotated with respect to the container neck;

a substantially circular central member depending downwardly from said closure cap top portion, the outer diameter of said central member being smaller than the internal diameter of the pour lip;

a first resilient gasket tightly encircling said central member and being positioned for vertical compression by the pour lip; and

a second resilient gasket tightly encircling said neck and overlying said cap support flange, said second resilient gasket being located to directly underlie the bottom of said annular skirt whereby downward axial movement of the cap with respect to the container neck will provide a vertical compressive force against said second resilient gasket by said cap skirt.

4,177,906

BLOW MOLDED PLASTIC BOTTLE AND PLASTIC CAP

Leo Von Hagel, North Massapequa, N.Y., assignor to Maxcap Inc., New York, N.Y.

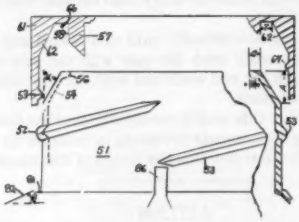
Filed May 31, 1978, Ser. No. 911,277
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—252 **38 Claims**

1. A combination of a blow molded plastic bottle and a plastic cap, comprising

(a) a bottle neck having a mouth, an external screw thread below said mouth and an inwardly directed portion at said mouth,

(b) said plastic cap adapted to be screwed onto said neck to cover said mouth and having an upper wall, a side wall with an internal thread corresponding to said external thread, and a downwardly directed circular plug for engaging said inwardly directed portion when said cap is screwed onto said neck and to form an anti-leak seal with said inwardly directed portion,

(c) cooperating antitamper means on said cap and bottle and including a permanently deformable element, said antitamper means permitting said cap to be rotated in one direction to screw said cap onto said neck to bring said plug into sealing relation to said mouth and then preventing rotation in an unscrewing direction unless said element is visibly deformed.



said inwardly directed portion having an inner surface and an outer surface, said inner and outer surface each extending upwardly and inwardly above said threads at an angle of at least about 30° to the horizontal,

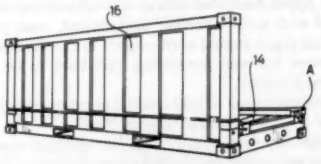
said plug having a circular outer surface for engaging said mouth, said outer surface of said plug being tapered to increase in diameter upwardly and to exert an outward force on said mouth and a corresponding inward force on said plug outer surface when said cap is screwed onto said neck.

4,177,907

SHIPPING CONTAINER

Ettore Funaioli, Bologna; Alfio Rossetti, Busto Arsizio, and Pier C. Landini, Castellanza, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Sep. 29, 1978, Ser. No. 947,316
Claims priority, application Italy, Sep. 30, 1977, 28134 A/77
Int. Cl.[2] B65D *7/26*
U.S. Cl. 220—1.5 **2 Claims**



1. A rigid collapsible container of parallelepipedic form, having a rectangular base wall, a roof, a pair of side walls and a pair of end walls, comprising:

the said rectangular base having a peripheral strengthening frame and provided at each of its four angles with a basic upright section terminating at its upper end with a rest surface on which, when the container is erected, an extension upright carried by the corresponding side walls come to rest in vertical alignement;

the two end walls hinged to opposite vertical edges of one of the side walls;

the said roof hinged at one of its longitudinal edges to the said one of the side walls by hinges carried by a longitudinal listel rigid with the said one of the side walls and

forming with the latter an angle of 90°, the width of said listel being not less than the thickness of the end walls, the roof also disengageably coupled in erected condition of the container to the other side wall, by means of a longitudinal listel rigid with said other side wall and forming with the latter an angle of 90°;

the side wall hingeably carrying the end walls and the roof being hinged to the base at a height less than that of the hinge of the said other side wall, the difference in height being not less than the thickness of the upright;

the structural relationship of the walls and roof of the container providing systematic container collapsing means wherein folding down of the erected container is only possible by the following successive operations:

folding of the end walls inwardly onto the side wall to which they are hinged,

folding the roof downwardly onto said folded end walls,

folding downwardly onto the base wall the said side wall together with the end walls and with the roof folded onto the side wall itself,

folding the other side wall downwardly onto the first one, all the folding movements involving a rotation of 90° and being carried out towards the inside of the container.

4,177,908

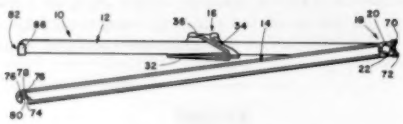
LOCKING PARALLEL BAR HANGER

John H. Batts, and Judd F. Garrison, both of Grand Rapids, Mich., assignors to John Thomas Batts, Inc, Zeeland, Mich.

Continuation-in-part of Ser. No. 773,536, Mar. 2, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,031

Int. Cl.[2] A47J *51/14*

U.S. Cl. 223—96 **29 Claims**



1. A hanger for suspending slacks, pants and the like comprising:

an elongated, lower bar;

an elongated, upper bar positioned above and spaced from said lower bar;

hinge means for detachably and hingedly joining said upper bar to said lower bar adjacent one of the ends of each of said bars, said hinge means permitting pivotal movement of said upper bar from a first, closed position above and parallel with said lower bar to a second, open position in a vertical plane angled with respect to the vertical plane of said lower bar and permitting said bars to be detached from each other;

support means joined to said lower bar intermediate the ends thereof for hanging said hanger; and

latching means a part of said lower bar and said upper bar for latching said upper bar to said lower bar when in the first, closed position.

4,177,909

CONVERTIBLE PURSE

Lois O. Haskell, 4550 Warwick Blvd., Kansas City, Mo. 64111

Filed Oct. 17, 1977, Ser. No. 842,574

Int. Cl.[2] A45F *3/04*

U.S. Cl. 224—153 **2 Claims**

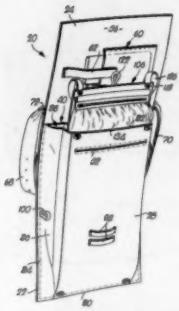
1. A convertible purse comprising:

a basic purse having at least one strap thereon and carryable in the form of a knapsack or a shoulder bag;

a main panel and a sheet of material secured thereto and cooperating therewith to define therebetween a major compartment presented by said basic purse, said main panel including a flap at its normally uppermost end, said main panel having a folding area extending transversely thereof, said basic purse being foldable along said area when the major compartment is empty, into overlapping relationship to present a hand carryable purse, there being a plurality of additional storage areas smaller than the major compartment formed in said basic purse, strap means on said flap fastenable to said sheet of material to close said major compartment when in the unfolded condition, and fastenable to the main panel to close said major compartment when in the folded condition;

a handbag adapted to be carried within said major compartment;

a clutch purse adapted to be carried by said handbag within said major compartment, said handbag and clutch purse being removable from said compartment and separable from one another for independent use;



at least one cosmetic pouch carried by said handbag and receivable within said major compartment together with the handbag;

said handbag having an open condition and a closed condition, the clutch purse and cosmetic pouch being carried by the handbag in its open condition, the handbag, clutch purse and cosmetic pouch being collectively receivable within said major compartment when the handbag is in its open condition, the handbag being independently usable as such when removed from the major compartment and placed in its closed condition; and

means on the handbag for supporting the same in an open condition when removed from the major compartment whereby to carry said cosmetic pouch in a position of access.

4,177,910

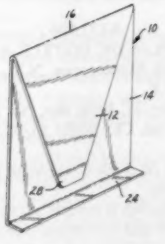
SHELL BOX HOLDING CLIP

William A. Gangl, 581 N. Hazel, St. Paul, Minn. 55119

Filed Apr. 27, 1978, Ser. No. 900,793

Int. Cl.[2] F42B *39/00*

U.S. Cl. 224—252 **6 Claims**



1. A shell box holding clip adapted to attach a standard box

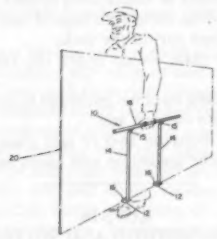
of shotgun shells to a shooter's belt or clothes and support the shells in a readily accessible position, wherein said clip comprises a planar outer portion adapted to extend full height along the wall of the box, an adjacent generally planar inner portion, joining means for joining adjacent ends of said inner and outer portions with said portions in face-to-face relationship and for resiliently biasing said inner and outer portions toward each other, a ledge portion at the end of the outer portion opposite its end joined to the inner portion which ledge portion projects from the side of the outer portion at which the inner portion is located and is adapted to engage the bottom surface of the box of shells, and means attached to said outer portion on its side opposite said ledge portion adapted for engagement with a shooter's belt or clothes; said inner portion extends the majority of the distance from said adjacent ends to said ledge portion; said joining means affords resilient separation and sliding of said inner and outer portions along opposite sides of one wall of the box with the ledge portion moved along its outer surface until the ledge portion moves along and is held adjacent the bottom surface of the box by the inner portion and the biasing of said joining means; and said inner portion has a part with a width generally the same as that of a said box located within a distance from said ledge portion equal to the height dimension of a said box to restrict movement of a said box with which the clip is engaged along said ledge portion transverse of said inner portion.

4,177,911

PANEL CARRIER

Edward O. Griffin, 54 Fort St., Presque Isle, Me. 04769

Filed Mar. 31, 1978, Ser. No. 892,021
Int. Cl.² B65G 7/12
U.S. Cl. 224—45 P **1 Claim**



1. A device facilitating the carrying by one man of a large flat building panel comprising

a metal frame, said frame having

a pair of spaced apart vertical legs,

a panel supporting foot at the bottom of each leg and extending toward the user when the device is in use, each foot having an upwardly extending lip at its end,

an elongated longitudinally extending handle interconnecting the legs at their upper ends and extending longitudinally beyond such upper ends,

said legs and feet being adapted to support the panel between them and the user of the device with a width of the panel tucked under one of the user's arms,

said legs near their upper ends being bent outwardly away from the load to offset the handle from the panel and provide space for the user's hand, and

said legs extending upwardly to locate said handle in the vicinity of the vertical location of the center of gravity of the panel and being spaced longitudinally apart to stabilize the same against tipping,

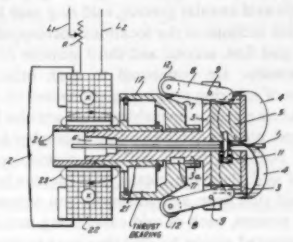
the portions of said handle which extend beyond the tops of the legs providing a convenient means for grasping the device and pushing it into place from one lifted end of the panel and the length of the handle permitting the user to shift his hand longitudinally along the handle to align the hand with the center of gravity of the panel so that the panel will be stable when carried.

4,177,912

APPARATUS FOR PLANETARY FEEDING OF ELECTRODE WIRE

David A. Samokovliski; Angel S. Angelov; Georgi N. Nachev; Peter D. Petrov; Alfred E. Nemechek, and Iliyana I. Vajarova, all of Sofia, Bulgaria, assignors to CUV "Progress", Sofia, Bulgaria

Filed Nov. 25, 1977, Ser. No. 854,536
Claims priority, application Bulgaria, Nov. 24, 1976, 34752
Int. Cl.² B65H 17/22
U.S. Cl. 226—176 **16 Claims**



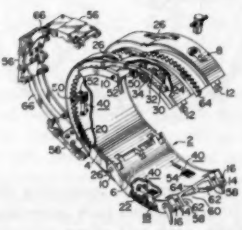
1. An apparatus for the planetary feeding of electrode wire, comprising a housing, means for mounting the housing for rotation about its axis, opposed canted rolls mounted on the housing on opposite sides of the axis of the housing for engaging and feeding electrode wire along the axis of the housing, means movable relative to the housing for adjusting the force with which the rolls engage the electrode wire, means for rotating the housing about its axis, and means including an electromagnetic coil and an element variably responsive to variations in the magnetic field produced by the energization of the coil for moving the adjusting means to adjust the force with which the rolls engage the electrode wire.

4,177,913

AUTOMATIC PIPE WELDING APPARATUS

Taro Iwamoto, and Shimon Ando, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1978, Ser. No. 877,861
Claims priority, application Japan, Mar. 1, 1977, 52-22339
Int. Cl.² B23K 37/02
U.S. Cl. 228—9 **19 Claims**



1. An automatic pipe welding apparatus, comprising:

an annular base member adapted to be disposed in concentric relation to a pipe, and including a semicircular first section, a quadrant circular second section and a quadrant circular third section, said second and third sections having one respective circumferential end pivotably connected to a respective circumferential end of said first

section, and their other circumferential end separably and lockably connected to one another;

at least three circumferentially spaced clamping means disposed on the inner periphery of said annular base member and operable to clamp the pipe for fixing said annular base member with respect to the pipe;

said annular base member having openings therein corresponding in number to the number of said clamping means and disposed at positions corresponding to those where said clamping means are located, a respective clamping means being moveable through a respective opening, said annular base member further having on the outer periphery thereof an annular concentric groove;

interlocking means for interlocking said at least three clamping means for joint movement to secure them to the pipe;

said interlocking means including a ring gear slidably received in said annular groove, said ring gear being divided into three sections at the locations corresponding to those where said first, second and third sections of said annular base member are connected to each other, said three sections of said ring gear being connected to each other so that said ring gear is openable as said annular base member is opened; pinions corresponding in number to the number of said clamping means with one pinion associated with each of said clamping means, said pinions being in mesh with said ring gear; and eccentric cam connected to each of said pinions, each of said cams being actuated through the connected pinion by said ring gear to urge the associated one of said clamping means against the pipe; and

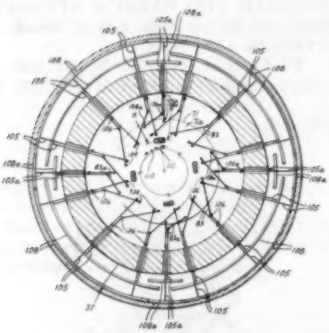
a carriage having a welding unit mounted thereon and being supported for circumferential movement on the outer periphery of said annular base member.

4,177,914

ROTARY INTERNAL PIPE CLAMP APPARATUS

Edward A. Clavin, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Feb. 6, 1978, Ser. No. 875,289
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—49 B **35 Claims**



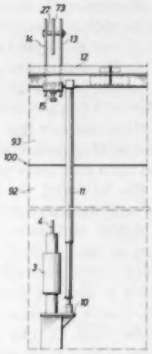
1. Welding clamp apparatus, comprising first and second axially spaced clamp assemblies each comprising plural circularly spaced clamps, each said clamp comprising a radially disposed element radially movable by toggle means having its outer end pivotally connected to said radially disposed element and having its inner end pivotally connected to one of first and second hub means each adapted to be driven in rotation about said axis, separate means for driving each said hub means in rotation about said axis in either direction to separately expand or retract each said clamp assembly.

4,177,915

METHOD FOR MANUFACTURING LARGE TANKS

Carl H. T. Blankenburg, Trosa, Sweden, assignor to Wikstrom International AB, Stockholm, Sweden

Filed Jun. 19, 1978, Ser. No. 916,495
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—184 **11 Claims**



1. In a method of manufacturing large tanks according to the "from the top and down" principle, whereby the roof of the tank is manufactured first at ground level, and successive plate sweeps, each having lugs mounted thereon, are attached one below the other, the completed part of the tank being raised in stages and a new plate sweep being fixed under the plate sweep immediately above it so that the tank grows from below, the improvement comprising:

mounting a plurality of lifting units around a plate sweep:

engaging said lifting units with lugs of said plate sweep to raise the finished part of the tank:

placing another plate sweep under the raised part of the tank:

mounting a welding machine guide rail to said lugs of one of said raised plate sweeps: and

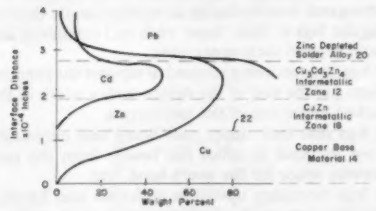
welding a seam between two of said plate sweeps with a welding machine guided on said guide rail.

4,177,916

SOLDERING METHOD AND SOLDER JOINT

Michael C. Denlinger, Anaheim; Robert W. Korb, Fountain Valley, and Vernon F. Lardenoit, Diamond Bar, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 858,491, Dec. 8, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,894
Int. Cl.[2] B23K *1/02, 35/26*
U.S. Cl. 228—231 **7 Claims**



1. The method of joining a metal part to a cooper base by soldering comprising:

placing a melted solder alloy consisting essentially of zinc substantially within the range of 0.5 to 1.0 weight percent, cadmium substantially within the range of 8 to 17 weight percent and lead as a balance constituent between a metal part and a copper base material and permitting it to solid-

ify to form a copper-zinc intermetallic layer at the juncture of the solder alloy layer and the copper base material; and

exposing the soldered copper base material with its solder layer and attached metal part to about 200° C. for at least one hour to at least partially convert the copper-zinc intermetallic layer to a copper-cadmium-zinc ternary interface layer.

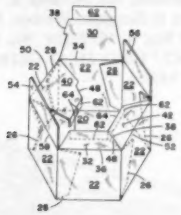
7. A solder joint made in accordance with the method of claim 1.

4,177,917

CONTAINER COVER WITH INTERLOCKING FLAP CONFIGURATION

George P. Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,899
Int. Cl.[2] B65D 5/22
U.S. Cl. 229—34 HW **9 Claims**



1. A container cover with straight outer side walls and having an interior, interlocking, flap configuration to adapt said cover to a taper-sided package tray, said cover comprising:

a. a center portion having vertical outer side walls equal in number to the slanted side walls of said package tray,

b. a plurality of inner wall flaps each integrally formed with and hingedly attached along one edge thereof to a corresponding selected one of said vertical outer side walls, and

c. means integrally formed with said flaps for interlocking adjacent pairs of said flaps whereby when said flaps are folded inwardly into said cover, resilient, slanted inner walls are formed to match and grasp the slanted sides of said package tray thereby centering said tray within said cover and maintaining said tray in its tapered configuration.

4,177,918

CARTON

Robert W. Lane, Park Hills, Ky., assignor to The C. W. Zumbiel Company, Cincinnati, Ohio

Filed Sep. 5, 1978, Ser. No. 939,327
Int. Cl.[2] B65D 5/10, 5/06, 5/28
U.S. Cl. 229—39 B **12 Claims**

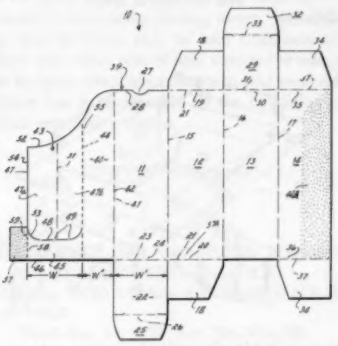
1. An improved carton for use in packaging an elongated fragile article, said carton comprising

multiple sidewalls connected one to the other,

a stop rib fixed to two opposed sidewalls at opposite ends of said stop rib, said stop rib being located at one end of said carton, and said stop rib being adapted to receive one end of said article in seated relation thereagainst for retaining said article in spaced relation from the one end of said carton,

a cushion flap hingedly connected at one side edge to one of those sidewalls to which said stop rib is fixed and unconnected at the other side edge to the other of those sidewalls to which said stop rib is fixed, and

at least one breakaway nick connecting said stop rib and said cushion flap in planar relation when said carton is erected prior to insertion of said article therein, said cushion flap being broken away from connected relation with said stop rib as said article is inserted into the open end of the erected but unfilled carton, said cushion flap being swingable on a hinge line to accommodate insertion of said



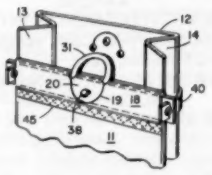
article in said carton, and said broken away cushion flap cooperating with said article to bias said article against at least two sidewalls of said carton for retaining said article in spaced relation from at least one other sidewall of said carton.

4,177,919

DISPOSABLE, RESEALABLE CONTAINER

Ricardo H. Soto, Apartado 91711, Bogota, Colombia

Continuation-in-part of Ser. No. 794,005, May 5, 1977, Pat. No. 4,102,487. This application Oct. 11, 1977, Ser. No. 840,628
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.[2] B65D 33/02, 33/06, 33/16
U.S. Cl. 229—54 R **13 Claims**

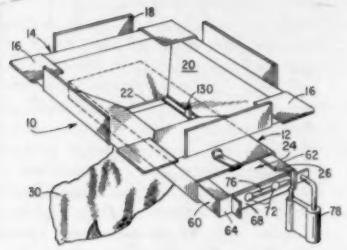


1. A sealable container comprising a bag having generally flat first and second panels and first and second pleated sides joining said panels together and cooperating therewith to define an open mouth, the upper portion of said first panel having its side edges separated from said pleated sides to define a foldable flap; an elongated, generally flat carrier providing a handle and held by said first panel and having an upper edge spaced from said mouth beneath said flap, said flap being folded against said edge and securing said carrier to said bag; means for attaching said folded flap to one of said carrier and first panel, whereby said carrier provides support to said bag and its contents when the bag is open; and lock means on said carrier for securing the upper portions of said pleats and said second panel to said carrier after they have been closed and folded over said upper edge of said carrier.

4,177,920
SELF-LOCKING COIN RECEPTACLE AND COVER THEREFOR

August M. Sciortino, 1919A Pickwick La., Glenview, Ill. 60025

Filed Jan. 12, 1978, Ser. No. 868,876
Int. Cl.[2] G07B *15/00*
U.S. Cl. 232—16 23 Claims

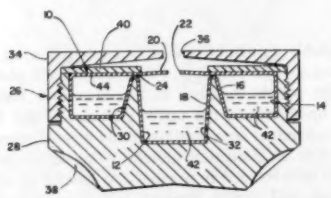


1. A cover assembly adapted to be locked onto a coin-receptacle capable of being inserted into a preformed recess of a coin-controlled machine of the type that has an interior coin chute having a delivery end opening to the recess; comprising, a top wall having a window adapted to be aligned with the coin chute when the cover is engaged on the coin receptacle and together therewith installed within the recess, slide means seated for slidable movement beneath the top wall to cover and uncover the window, first spring means secured to the cover and to said slide means for biasing the slide means to a condition whereat the window is covered and spring catch means coupled between the slide means and said cover operable between a first condition permitting movement of said slide means against the bias of said first spring means and a second condition whereat to prevent movement of said slide means against said spring bias and detent means within said cover and operable with the movement of said slide means, said detent means being disposed normally away from said window, said slide means operable to drive said detent means positively into said window when said slide means is manipulated against the bias of said first spring means partially or fully to uncover said window, whereby withdrawal of said coin-receptacle from said recess is prevented except when the window is fully covered.

4,177,921
ONE PIECE CHYLOMICRON ROTOR LINER

Steven T. Nielsen, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 29, 1977, Ser. No. 837,659
Int. Cl.[2] B04B *1/00*
U.S. Cl. 233—20 R 3 Claims



1. A multicompartment rotor liner for receipt of a fluid mixture and for use in a centrifuge rotor, said liner comprising:

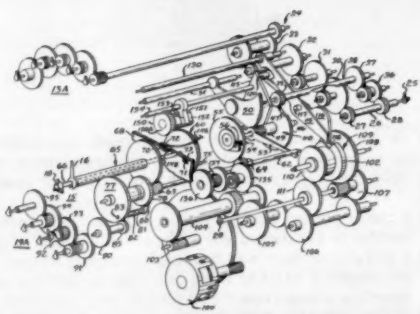
a lower portion having a generally cylindrical central chamber and an annular chamber surrounding said central chamber, said central and annular chambers being separated by a double wall, said annular chamber receiving one constituent of said mixture during centrifugation and said central chamber receiving another constituent of said mixture during centrifugation; and

a cover integrally formed with said lower portion and having a central access aperture, the top of said double wall establishing the upper limit of said central chamber, said cover when in engagement with said top of said double wall defining the vertical extent of the top of said central chamber to prevent the establishment of a cavity in said central chamber above said top of said double wall, so that none of said another constituent will accumulate above said top of said double wall when said liner is in said rotor and subjected to centrifugation to eliminate inadvertent introduction of said another constituent into said annular chamber when a pipette is inserted through said central access aperture to said annular chamber.

4,177,922
MOTOR DRIVEN RESET MECHANISM FOR CUMULATIVE DEMAND REGISTER

David G. Hart, Clemson, and Norman B. Venaas, Seneca, both of S.C., assignors to Sangamo Weston, Inc., Atlanta, Ga.

Filed Sep. 8, 1977, Ser. No. 833,175
Int. Cl.[2] G06C *15/42;* G01R *11/02*
U.S. Cl. 235—144 MA 10 Claims



1. In an electrical power meter, the combination of a period maximum demand register comprising a dial including an indicating hand; first gear means including pusher gear means rotatable in a recording direction and a reset direction, said first gear means operably connected to advance and reset said period maximum demand register when said pusher gear means is rotated in said recording and reset directions respectively, the angular displacement of said pusher gear means being representative of maximum demand in a predetermined period; second gear means responsive to an input drive for driving said pusher gear in said recording direction; reset means for periodically resetting said pusher arm means to a reset position; and a cumulative demand register; reset drive means; means including a reset gear having first and second axially displaced positions; said reset gear further including hold-out pin means extending from one surface thereof; a fixed plate adjacent said one surface of said reset gear and defining stowage slot means adapted to receive said hold-out pin means when said reset gear is in said first axial position, said hold-out pin means riding on said plate when said reset gear is in said second axial position; reset spring means for biasing said reset gear when said pin means is received in said stowage slot means for urging said pin means against one edge of said stowage slot means to define the zero reset position of said reset gear; manual reset means for moving said reset gear to said second axial position, said reset gear engaging said reset drive means in said second axial position and adapted to engage said pusher gear to drive the same in the reset direction; and third gear means including unidirectional drive means responsive only to the turning of said reset gear in said reset direction to

advance said cumulative demand register by an amount representative of the angular displacement of said pusher gear from its initial position, said reset drive means being further operative to reset said period maximum demand register when said pusher gear means is driven in the reset direction.

4,177,923

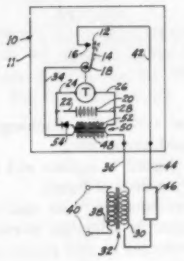
BATTERY OPERATED THERMOSTAT TIMER WITH BATTERY CHARGING CIRCUITS

Robert C. Krump, Waterloo, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 800,508, May 25, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,217

Int. Cl.[2] H02J *7/00*; F23N *5/20*

U.S. Cl. 236—46 R **4 Claims**



1. In a timer controlled space thermostat for switching a circuit connecting remote space conditioning apparatus with a remote A.C. power source, electrically operated timer means for periodically changing the temperature set point of said thermostat, a rechargeable battery for operation of said timer means, charging means for said battery comprising a transformer having a primary winding in said circuit and a secondary winding connected across said battery, current rectifying means connected in series with said secondary winding and said windings being so connected as to be only energized when the thermostat is closed.

4,177,924

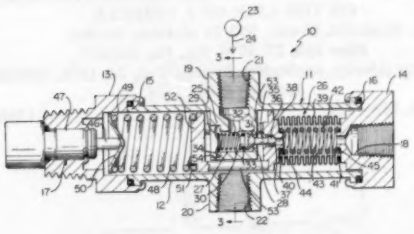
CONDITION RESPONSIVE VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, and Edwin M. Dexter, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 23, 1977, Ser. No. 854,423

Int. Cl.[2] G05D *23/02*

U.S. Cl. 236—86 **20 Claims**



1. In a condition responsive valve construction for varying the output pressure of said valve construction in relation to a movable part of a condition responsive means of said valve construction that is moved in relation to the condition sensed thereby, said valve construction having a housing means provided with an inlet to be interconnected to a fluid pressure source and an outlet separated from said inlet by main valve means and being adapted to be interconnected to vent by vent valve means, said valve means being controlled by said condition resonsive means, said vent valve means comprising a movable vent valve member and a movable vent valve seat adapted to be opened and closed by said vent valve member, the improvement comprising biasing means operatively interconnecting said movable part of said condition responsive means to said vent valve seat of said vent valve means to urge the same to an open condition relative to said vent valve member by a force that is changeable by the condition sensed by said condition responsive means.

4,177,925

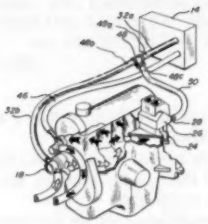
HEATER ADAPTER FOR IMPROVED AUTOMOBILE HEATER PERFORMANCE

Lloyd W. Ashling, 10101 Lyndale Ave. South, #212, Bloomington, Minn. 55420

Filed Jun. 19, 1978, Ser. No. 916,746

Int. Cl.[2] B60H *1/02*

U.S. Cl. 237—12.3 B **4 Claims**



1. A method of improving heater performance of an automotive vehicle of the type having:

an internal combustion engine;

internal coolant passages in the engine and having a first coolant outlet and a coolant inlet,

an intake manifold mounted on the engine and communicating with the internal coolant passages and having a second coolant outlet;

a vehicle mounted radiator having an inlet and an outlet, the radiator inlet being connected to the first coolant outlet, a coolant pump connected between the radiator outlet and the coolant inlet of said engine to circulate liquid engine coolant through the engine between the coolant inlet and the first and second coolant outlets;

a vehicle mounted heater core having an inlet and an outlet, a first conduit connecting the heater core outlet to the coolant pump inlet, a second conduit normally causing the heater core inlet to receive coolant from the second coolant outlet;

a thermostatic valve connected to the engine and adjusted to control coolant flow from the first coolant outlet, the thermostatic valve being closed at temperatures below a predetermined value to prevent coolant flow through the radiator and opening in response to temperatures above the predetermined value to permit a controlled flow of coolant through the radiator;

the method comprising:

connecting a detachable fitting to the first coolant outlet with an auxiliary outlet between the first coolant outlet and the thermostatic valve,

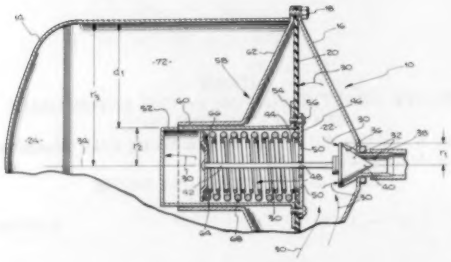
and providing a fluid connection directly from the auxiliary outlet of said fitting to the heating core inlet independently of the second conduit so that heated fluid from the engine is supplied directly to the heater core rather than merely through the intake manifold.

4,177,926

WATER ACCUMULATOR-DISTRIBUTOR FOR AGRICULTURAL SPRINKLER

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, Riverside, Calif.

Filed Mar. 30, 1978, Ser. No. 891,825
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—99 **22 Claims**



1. An improved water accumulator-distributor for an agricultural sprinkler comprising:

(a) a hollow closed body having an inlet adapted for connection to a source of fluid under pressure and an outlet opening including a valve seat;

(b) a flexible diaphragm disposed within said body to divide said body into two chambers, said inlet and said outlet opening being in communication with one of said two chambers, the other of said two chambers being filled with compressed gas at a pressure less than the minimum pressure of said fluid under pressure;

(c) a valve member adapted for sealed mating with said valve seat to close said outlet opening to prevent fluid from exiting said one of said two chambers to said outlet opening, said member being movable between a first position where said valve seat is closed thereby and a second position where said valve seat is open for the passage of fluid therethrough to exit said body through said outlet opening;

(d) first bias means carried by said flexible diaphragm for increasingly urging said valve member towards said second position as said flexible diaphragm is flexed by an increasing volume of fluid under pressure being introduced into said one of said two chambers through said inlet, said first bias means being adapted to produce a maximum bias force insufficient to lift said valve member from said valve seat against the differential pressure of said fluid in said one chamber when said valve member is in said first position and sufficient to move said valve member completely from said first position to said second position when said differential pressure is removed therefrom; and,

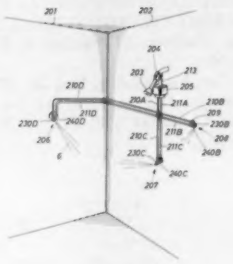
(e) means carried by said flexible diaphragm for lifting said valve member from said valve seat an amount sufficient to remove the differential pressure therefrom when said diaphragm reaches its desired point of maximum flexure from the passage of fluid under pressure into said one of said two chambers whereby said valve member is moved to said second position by said first bias means to allow the water accumulated in said one chamber to be expulsed through said outlet opening.

4,177,927

APPARATUS FOR SHAPING AND POSITIONING FLUID DISPERSAL PATTERNS

Thomas R. Simmons, 3510 Lobit, Dickinson, Tex. 77027

Filed Dec. 14, 1977, Ser. No. 860,394
Int. Cl.[2] B05B *1/08*; A47K *3/00, 3/22*
U.S. Cl. 239—101 **4 Claims**



1. A fluid dispersal system for discharging an oscillating fan-like stream of liquid, comprising

a pair of conduits aligned in a plane and interconnected to receive and carry a flow of liquid,

nozzle means interconnected with said conduits for discharging said liquid as a fan-like stream positioned substantially perpendicular to said plane, said nozzle means includes a deflector means therein for forming said fan-like stream, said control means causes the stream to sweep between preselected limits of oscillating travel with said plane, said nozzle means further comprises a tubular conduit member formed into a substantially U-shaped configuration including a pair of legs lying in the same plane and joined by an arcuate portion, said arcuate portion having first and second exterior surfaces spaced opposite one another, an aperture in said first surface of substantially wedge shape when viewed in a direction perpendicular to said plane and of a shape substantially that of a sector of a circle when viewed in a direction parallel to said plane, said deflector means being formed by said second surface having a crimp therein extending substantially perpendicular to said plane, and

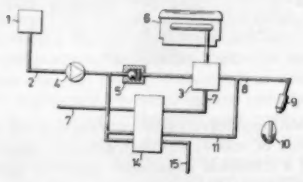
control means interconnected with said conduits for oscillating said fan-like stream in parallel alignment with said plane and at a predetermined rate of approximately 0.5 seconds.

4,177,928

DEVICE FOR CLEANING WINDSHIELDS, HEADLAMP LENSES, REAR VIEW MIRRORS, REFLECTOR MEANS OR THE LIKE OF A VEHICLE

Lars A. Bergkvist, Gottne, 890 26 Moliden, Sweden

Filed Feb. 23, 1976, Ser. No. 660,677
Claims priority, application Sweden, Feb. 24, 1975, 7502058
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—129 **8 Claims**



1. A system to be installed in vehicles for cleaning windshields, headlamp lenses, rear view mirrors, reflector means or

the like of the vehicle, comprising: liquid container means; a steam generator having heating means adapted to be connected to an energy source in the vehicle; conduit means, including pump means having at least one pump connected between the liquid container means and said steam generator for advancing liquid in the conduit means from the container means, and said conduit means including a check valve downstream of said pump to prevent return flow of liquid from the steam generator to the container means; outlet conduit means connected to said steam generator for passing steam from the steam generator to the vehicle parts to be cleaned; shunt conduit means from said first mentioned conduit means by-passing said steam generator and having a connection to the outlet conduit means so that steam from the generator meets and intermixes with liquid from the shunt conduit and advances the mixture to the vehicle part or parts to be cleaned.

4,177,929

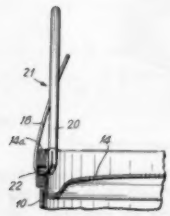
FLIP-TOP CAN CONSTRUCTION

John C. Murray, R.D. #1, Broad Top, Pa. 16621

Filed Nov. 2, 1978, Ser. No. 956,949

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—270 **5 Claims**



1. A can for containing a liquid comprising a cylindrical main body portion, a lid portion including a removable lid segment and an upstanding lip surrounding said lid portion and means provided for securing said segment to said lip after its removal from said lid portion, said lid portion being generally circular with a diameter and a center and said means comprising an opening defined by said lip, said segment extending through said opening after its removal.

4,177,930

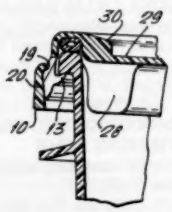
CLOSURE HAVING OPENING MEANS

Victor E. Crisci, Wellsburg, W. Va., assignor to Polysar Resins, Inc., Leominster, Mass.

Filed May 30, 1978, Ser. No. 910,527

Int. Cl.[2] B65D *43/26*

U.S. Cl. 220—284 **10 Claims**



1. A closure for a container comprising:

(a) a cover portion; and

(b) a continuous rim flange extending around the cover portion;

(c) the rim flange extending downwardly from a base end to a free end and having:

(i) a circumferentially discontinuous and radially inwardly projecting locking bead for locking engagement with a container;

(ii) a plurality of circumferentially spaced-apart access regions disposed between the base end of the flange and the locking bead and in circumferential positions between adjacent discontinuous sections of the locking bead to enable a closure removal tool to be inserted downwardly through each access region and between adjacent discontinuous sections of the bead; and

(iii) a plurality of rim stiffening protrusions which project from the outer surface of the flange in at least said circumferential positions between the discontinuous sections of the bead and which overlie the circumferential line of the locking bead to resist bending of the flange circumferentially in said circumferential positions upon prising of the free end of the rim flange radially outwards by the closure removal tool inserted downwardly through the access regions and to assist bending outwards of the flange circumferentially at each side of said access regions to promote radial outward movement of the locking bead.

4,177,931

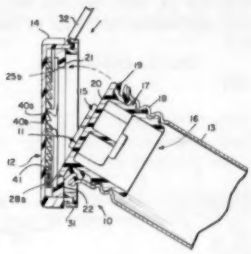
BREAKAWAY GAS CAP

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Oct. 4, 1978, Ser. No. 948,424

Int. Cl.[2] B65D *41/04, 41/32*

U.S. Cl. 220—288 **12 Claims**



1. A cap for an automobile fuel fill neck, comprising an inner portion having a central portion adapted to close and seal the neck and having peripheral portions, an outer portion carried by said peripheral portions and providing a hand engaging surface to be used to insert and remove the central portion from the neck, said inner portion including a frangible section defined between the central portion and the peripheral portions to enhance breakage of the gas cap without affecting the closure and sealing of the neck.

4,177,932

THERMOPLASTIC CONTAINER FOR STORING AND DISPENSING SOLID PARTICULATE MATERIAL

Bruce T. Cleevely, Pittsburgh, Pa., assignor to The C. F. Sauer Company, Richmond, Va.

Filed Mar. 6, 1979, Ser. No. 18,062

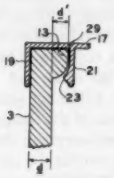
Int. Cl.[2] B65D *39/00*

U.S. Cl. 220—307 **6 Claims**

1. In a thermoplastic container for storing and dispensing solid particulate material, the container comprising a body portion having side and end walls, a closed bottom end and an open mouth, and a friction fit dispensing cap having a downwardly extending outer wall and spaced downwardly extending locking flange carrying locking ribs thereon, the improvement wherein:

said body portion is of unitary, seamless, thermoplastic construction having adjacent the open mouth thereof inwardly extending locking and sealing beads, the locking

portion of said beads being along the walls of said body portion and having a thickness sufficient to frictionally lock the cap onto said body portion through contact with



the upperside of ribs of said cap, and the sealing portion of said beads being at the juncture of adjacent walls of said body portion and having a thickness less than that of the locking portion of said beads.

4,177,933

CONTAINER AND CLOSURE THEREFORE

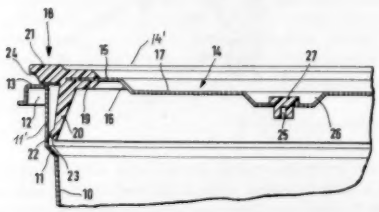
Gunter Lumpp, Reutlingen, Fed. Rep. of Germany, assignor to Rieber Werke Heinrich Rieber KG, Reutlingen, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,377

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 7731724[U]

Int. Cl.[2] B65D *39/00*

U.S. Cl. 220—307 **9 Claims**



1. A container, comprising a container body provided with a neck portion forming an opening; and a removable lid operative for firmly closing said opening and including a cap body adapted to substantially cover said opening of the container when the latter is in assembly with the lid, an outer elastomeric rim circumferentially and outwardly projecting from said cap body and comprising a lower annular portion extending substantially normal to the elongation of said cap body and adapted to firmly engage the inner wall of the neck portion of the container when the latter is in assembly with the lid, said lower portion being provided with a free end opposite said cap body and having a bulge extending outwardly from said free end and formed with an inclined surface, said rim further comprising an upper portion so spaced from said lower portion as to engage the outer upper surface of the neck portion when said lower portion is inserted all the way in said opening, thus preventing further penetration of the lid inside the opening of the container and ensuring firm closing of the container, said upper portion of the rim being provided on an inner side thereof with a shoulder part defining a space between the upper outer surface of said neck portion and the inner side of said shoulder part, so as to define a gripping surface on said upper portion operative to be gripped when said lid is to be withdrawn from said opening.

4,177,934

CONTAINER AND LID

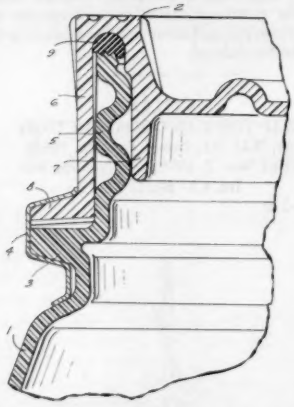
Theo Hammes, Cologne, and Alois Hoff, Brühl, both of Fed. Rep. of Germany, assignors to Mauser Kommandit-Gesellschaft, Brühl, Fed. Rep. of Germany

Continuation of Ser. No. 701,870, Jul. 1, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,032

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544491

Int. Cl.[2] B65D *45/32, 43/06, 7/42*

U.S. Cl. 220—319 **6 Claims**



1. A container, comprising in combination a container body including an upper wall portion having a predetermined thickness and comprising an upwardly converging section and a substantially uprig' t section above the converging section and with which the converging section is unitarily integrated; a neck portion axially spaced from said upper wall portion and having substantially said predetermined wall thickness; a first radially outwardly extending flange unitarily integrated with the substantially upright section of said upper wall portion of said container and with said neck portion, said first flange having an upper surface and an axial thickness which is equal to substantially twice the thickness of said predetermined thickness; a lid comprising an external wall surrounding said neck portion and which includes a second radially outwardly extending flange having a lower surface abutting against the upper surface of said first flange, said external wall being circumferentially complete so as to insure a uniform distribution of load applied to said wall and resulting from forces acting axially upon said container; and an annular connecting element operative for urging said first and second flanges together into alignment in the axial direction of the container and for uniformly clasping the flanges to thereby eliminate undesirable local deformation of said element due to the same forces and thus to insure permanent sealing closure of the container by said lid.

4,177,935

LINED BULK CONTAINER AND METHOD OF FORMING SAME

Michael J. Centanni, New Orleans, La., assignor to The Continental Group, Inc., New York, N.Y.

Filed Apr. 7, 1978, Ser. No. 894,542

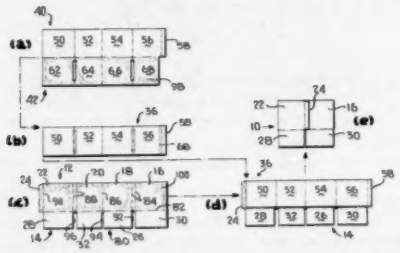
Int. Cl.[2] B65D *5/56;* B31B *49/02*

U.S. Cl. 220—417 **9 Claims**

1. A method of forming a knocked-down double lined box, said method comprising in a continuous flow providing a liner blank including first and second liner portions joined along a longitudinal fold line and wherein the first and second liner portions are divided into panels by longitudinally spaced transverse fold lines aligned in the two liner portions, there being

formed slots along at least two of the furthest longitudinally remote ones of said longitudinally spaced transverse fold lines of said second liner portion, folding said liner blank along the longitudinal fold and adhesively bonding together the two liner portions, providing a flat box blank having a body portion with transverse fold lines of the same general longitudinal spacing as in the liner portions, positioning the folded and bonded liner blank relative to the box blank body portion and bonding the one of the liner portions to the box blank body portion, and then folding the assembled box blank and liner blank as a unit along the two longitudinally remote transverse fold lines to form the knocked-down double lined box.

7. A knocked-down liner box, said box comprising a generally rectangular box blank including an elongated body portion divided into a plurality of panels by longitudinally spaced transverse fold lines, a generally rectangular liner blank including first and second elongated liner portions integrally joined along a longitudinal fold line and disposed in relative overlying relation, said first and second liner portions being adhesively



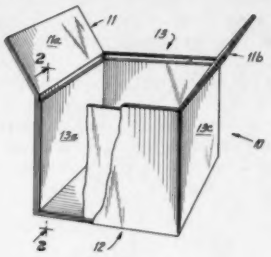
bonded together, said liner portions having aligned transverse fold lines longitudinally spaced in accordance with the longitudinal spacing of said box blank fold lines, said second liner portion being adhesively bonded to said box blank body portion, said transverse fold lines including at least two of which are longitudinally remote transverse fold lines remote from the center of said liner blank defining outer panels and other fold lines defining inner panels, the assembled box blank and liner blank outer panels being folded into relatively overlying relation with respect to said inner panels of said box blank and liner panels, said second liner portions having transverse slots along said longitudinally remote transverse fold lines receiving aligned material of said folded first liner portion, said slots being of a selected length which assures square folding of said outer panels relative to said inner panels, said slots each forming a portion of a respective longitudinally remote transverse fold line and having opposite ends terminating remote from an adjacent end of a respective longitudinally remote transverse fold line.

4,177,936
VARIABLE FLUTE CONTAINER

Mack L. Ford, Jr., Westerville, and William W. McFarland, Wooster, both of Ohio, assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 803,970, Jun. 6, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 943,772
Int. Cl.[2] B32B *3/28*; B65D *25/14*
U.S. Cl. 220—441 **2 Claims**

1. In a corrugated container comprising a top portion, a bottom portion and a main body therebetween, the top portion, bottom portion and main body consisting of in combination at least one integral material layer and an integral double face liner, each material layer consisting of a single face liner and a fluting medium, the fluting medium having one free side and the other side thereof being attached to one side of the single face liner, each material layer being attached to the next of the material layers in sequence such that the other side of the single face liner of the next material layer is attached to the free side of the fluting medium of the previous material layer in sequence, and the double face liner being attached to the free side of the fluting medium of the final of the material layers in sequence, the improvement comprising at least one contiguous reinforcing layer on the main body between the last material layer in sequence thereof and the double face liner whereby the main body is reinforced as compared to the top and bottom portions, each reinforcing layer consisting of a single face liner and a fluting medium, the fluting medium having one free side

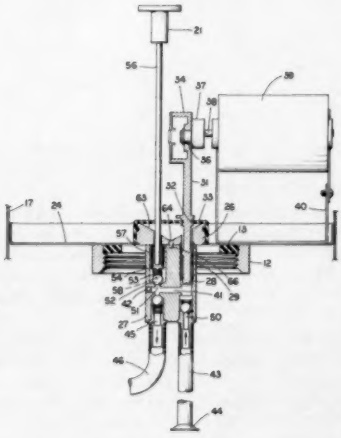


and the other side being attached to one side of the single face liner, the first of the reinforcing layers being attached to the main body such that the other side of the single face liner of the reinforcing layer is attached to the free side of the fluting material of the last material layer in sequence and the other of the reinforcing layers being attached in similar sequence to the first of the reinforcing layers, the double face liner being attached to the fluting medium of the final of the reinforcing layers in sequence.

4,177,937
CONSTANT PRESSURE SPRAYING APPARATUS

Robert E. Stevens, and Albert L. Schlensker, both of Westfield, Ind., assignors to Curtis Dyna Products Corporation, Westfield, Ind.

Filed May 11, 1978, Ser. No. 904,768
Int. Cl.[2] F04B *49/08, 49/06*
U.S. Cl. 222—63 **5 Claims**



1. A constant pressure pumping assembly adapted to be mounted on one wall of a tank containing a liquid to be pumped from the tank, said assembly comprising a base plate, a flow control body extending from one face of said base plate into said tank, a pump piston extending into a piston bore in said control body, an electric motor and a pump discharge

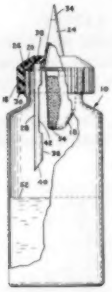
pressure responsive switch controlling the motor both mounted on said base plate, motion transmission means between said motor and piston whereby when said motor is energized said piston is reciprocated in said bore to provide a positive displacement pump, check valve controlled suction and discharge passages in said control body communicating with the space adjacent the working face of the piston, a by-pass passage communicating with said space and with the interior of the tank, a priming member for blocking said by-pass passage when in operating position and opening said by-pass passage when in priming position, a closure member for said flow control body overlying said body and extending from the other face of said base plate, the outer surface of the closure member having a concave configuration with a drain aperture at its lowermost point, said piston bore intersecting said concave surface whereby fluid leakage past said piston is directed by said concave surface into said drain aperture.

4,177,938

CONTAINER WITH MIXING CARTRIDGE

Guido J. Brina, 9 Club Cir., Monmouth Beach, N.J. 07750

Filed Jun. 30, 1977, Ser. No. 811,587
Int. Cl.[2] B65D *25/08*
U.S. Cl. 222—80 **6 Claims**



1. A container for storing separate components and for mixing said components comprising:

a vessel having a mouth;

a cap adapted to engage the mouth of said vessel;

a sealed cartridge disposed in the mouth of said vessel, said sealed cartridge asymmetrically formed to partially fill the mouth of said vessel to leave a passage therein for the flow of liquids therethrough; and having an upper and lower surface

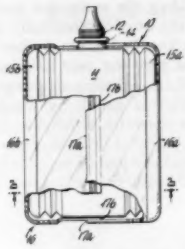
a piercing member connected to said cap of said vessel, disposed asymetrically on said cap to extend through the passage in said mouth of said vessel when said cartridge member and said cap are aligned in a first relative position, and to extend through upper and lower surfaces of said cartridge member when said cartridge member and said cap are aligned in a second relative position, so that the contents of said vessel can pass through said passage left in the mouth of said vessel without piercing the cartridge when said piercing member is in said first position, and the contents of said cartridge will be passed through the hole produced by said piercing member upon the positioning of said piercing member through said cartridge.

4,177,939

SQUEEZE BOTTLE

Ralph H. Thomas, Clark, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 817,958
Int. Cl.[2] B65D *1/32*
U.S. Cl. 222—153 **3 Claims**



1. A squeeze bottle comprising a container having a neck portion containing a spray unit and bellowed side walls

(a) said bellowed side walls being adapted to be compressed inwardly to apply pressure to the contents of said container and to return to their normal position when the pressure is released;

(b) shroud means encompassing at least a portion of each of said bellowed side walls, said shroud means comprising a pair of sections each having free inner margins disposed in overlapping relationship with respect to each other, each of said shroud sections being adapted to move inwardly when compressed and to apply pressure to said side bellowed walls; and

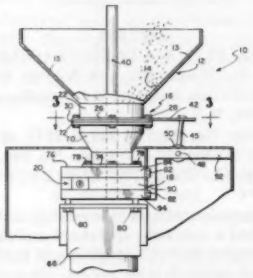
(c) the overlapping portions of said shroud sections having bead and groove means disposed in mating relationship, said mating relationship being adapted to be released by a predetermined pressure applied inwardly to said shroud sections.

4,177,940

FLOCK FIBER FEEDING APPARATUS HAVING A PLURALITY OF IMPELLERS AND A VENTURI FLOW TUBE

John P. McHugh, Lexington, Ky., assignor to Solar Suede Corporation, Lexington, Ky.

Filed Apr. 1, 1977, Ser. No. 783,801
Int. Cl.[2] B67D *5/54*
U.S. Cl. 222—636 **10 Claims**



1. Flock fiber feeding apparatus comprising a fiber-receiving hopper having a downwardly open discharge passage; means for urging flock fibers downwardly through the discharge passage; a pump mounted below the discharge passage and having a pump chamber in communication with the discharge passage, said pump having a pump throat in communication

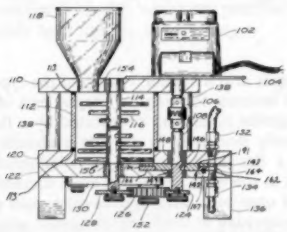
with the pump chamber; a shaft extending substantially vertical within the hopper and within the pump chamber of said pump; an impeller mounted on said shaft within the pump chamber; a motor connected to said shaft for drivingly rotating said shaft so that said impeller sweeps flock fibers into the inlet end of the pump throat; and a venturi flow tube at an angle to and in communication with the outlet end of the pump throat so that flock fibers are drawn by suction out of the throat and into the flow tube when an air stream is passed through said flow tube for entrainment of the fibers with the air stream, said pump throat extending transversely to the shaft.

4,177,941

METERING DEVICE

Basil K. J. Leong, Portage, Mich., assignor to International Research and Development Corporation, Mattawan, Mich.

Filed Nov. 2, 1977, Ser. No. 847,774
Int. Cl.[2] G01F *11/24*
U.S. Cl. 222—636 **16 Claims**



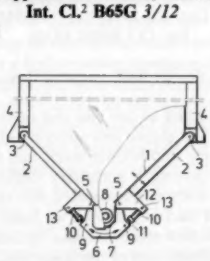
1. In a metering device for metering a powdered material which is capable of handling both free-flowing powders and non free-flowing powders, which device comprises a mixing chamber having a rotary-driven stirring means therein, and rotary-driven metering means for removing measured portions of powdered material from said mixing chamber, the combination therewith of a motor which is connected to drive one of said stirring means and said metering means directly, and the other indirectly, in which said stirring means and said metering means are connected together by a power-transfer means adapted to maintain a predetermined rate of rotation of one of said means with respect to the other, said power-transfer means being adjustable so that the said predetermined rate of rotation can be altered, and in which said power-transfer means comprises a gear train having a changeable gear ratio.

4,177,942

SILO DISCHARGING MEANS

Seppo Häkkinen; Niilo Nyman; Ossi Kilpeläinen; Ilmari Paakkinen, all of Savonlinna; Kari Rautapaa, Punkasalmi, and Seppo Rasimus, Savonlinna, all of Finland, assignors to Enso-Gutzeit Osakeyhtiö, Helsinki, Finland

Filed Mar. 17, 1978, Ser. No. 887,839
Claims priority, application Finland, Mar. 30, 1977, 770986
Int. Cl.[2] B65G *3/12*
U.S. Cl. 222—198 **7 Claims**



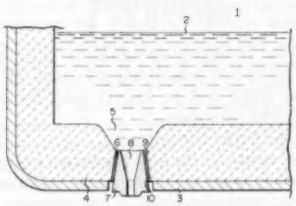
1. Improvement in discharging means for a silo comprising side walls including upright supports, and a pair of bottom plates arranged in a V-shaped configuration with said bottom plates extending downwardly from said side walls and inwardly toward one another in the downward direction, said bottom plates each having an upper margin and a lower margin, the lower margin of said bottom plates being spaced apart and forming therebetween a discharge aperture through which goods can be discharged from said silo, and actuating means connected to said bottom plates for moving said bottom plates in a reciprocating manner, wherein the improvement comprises that each said bottom plate is pivotally connected at the upper margin thereof to said side walls, connecting means pivotally connected to each of the lower margins of said bottom plates, said actuating means pivotally connected to said connecting means at locations spaced from the pivotal connection of said connecting means to said bottom plates, the pivotal connections of said connecting means to said bottom plates and to said actuating means forms a quadrangle linkage, and said actuating means arranged for moving the bottom margins of said bottom plates in a reciprocating manner so that said bottom plates pivot about the connections thereof to said side walls.

4,177,943

REFRACTORY RELEASING AGENT

Hiroyuki Suzuki, Tokyo, Japan, assignor to Daishin Kako Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 813,873
Int. Cl.[2] B22D *41/02, 41/08*
U.S. Cl. 222—591 **4 Claims**



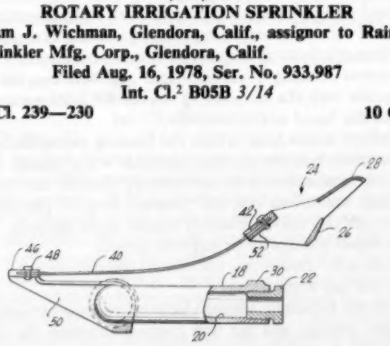
1. A ladle having a nozzle-receiving bore, wherein said bore is coated with the releasing agent comprising graphite powder in an amount sufficient for imparting lubricity to the releasing agent, water and at least one kind of water-soluble and gelatinizable polysaccharide dissolved in the water in an amount sufficient for gelatinizing the releasing agent so as to impart coating capability and adhesiveness to the receiving agent and wherein a refractory nozzle is inserted into said nozzle-receiving bore so as to be in contact with said releasing agent.

4,177,944

ROTARY IRRIGATION SPRINKLER

William J. Wichman, Glendora, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Aug. 16, 1978, Ser. No. 933,987
Int. Cl.[2] B05B *3/14*
U.S. Cl. 239—230 **10 Claims**



1. A rotary irrigation sprinkler comprising:

a body member mounted for rotation about a substantially vertical axis;

means for periodically impacting said body member thereby imparting to said body member an increment of rotational movement about said vertical axis, said means deriving said rotational movement from a stream of water ejected from said sprinkler;

said means for impacting being supported on a first end of a flexible arm of inherent resiliency; and

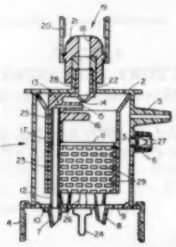
a second opposite end of said flexible arm means being secured to said body member.

4,177,945

HUMIDIFIER UNIT

Charles M. Schwartz, Columbus, Ohio, and Eugene J. Meierhoefer, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 6, 1978, Ser. No. 883,609
Int. Cl.[2] A61M *11/02*; B05B *7/30*
U.S. Cl. 239—338 **13 Claims**



1. A unit for producing an entrained liquid aerosol in a pressurized gas stream comprising a vacuum-tight bottle for supplying the liquid and an adapter head for coupling the liquid pressurized gas stream,

(A) wherein the bottle comprises

(i) reservoir means for the liquid including a breachable seal,

(ii) connecting means including a breachable seal for communicating with the liquid in the reservoir means and supplying the liquid through a liquid passage to the adapter head, and

(B) wherein the adapter head comprises

(iii) housing means having an inlet opening for pressurized gas, an exit opening for aerosol laden pressurized gas and first and second breaching cannulae below the inlet and exit openings and on the lower extreme of the housing means,

the first cannula breaching the breachable seal of the connecting means for communicating with the liquid so as to be in liquid communication with the reservoir means, the second cannula breaching the breachable seal on the reservoir means so as to be in communication with the reservoir means for returning excess liquid from the housing means to the reservoir means,

(iv) means forming a vacuum-tight seal between the first cannula and the connecting means for communicating with the liquid in the reservoir,

(v) venturi means fixed within the housing means including a venturi channel and a perpendicular liquid passage operatively associated with the venturi channel and downstream thereof so that the pressure drop of gas passing through the venturi channel causes liquid droplets from the liquid passage to be inspired therein,

(vi) means for connecting the venturi channel with the pressurized gas stream, and

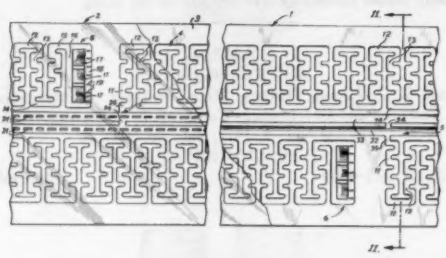
(vii) means forming a vacuum-tight connection between the liquid passage and the first cannula whereby the liquid passage is in liquid communication with the reservoir means.

4,177,946

INTEGRAL DRIP IRRIGATION SYSTEM

Jaime Sahagun-Barragan, Calle del Teco 287, Zamora, Mich., Mexico

Filed Mar. 23, 1978, Ser. No. 889,398
Claims priority, application Mexico, Apr. 11, 1977, 168682
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—533.1 **11 Claims**



1. An integral drip irrigation system of the type comprising an elongated laminate forming an integral part of a piping for carrying irrigation liquid and constituted by a flexible plastic sheet, thermally deformed to provide a plurality of cavities therein and a flat flexible plastic sheet adhered to said deformed sheet at the most prominent areas thereof to complete passages and chambers with said cavities, said passages and chambers comprising at least one elongated winding passage running along the laminate; at least one irrigation liquid admission zone capable of receiving said liquid from said pipe and feed it to said at least one winding passage through one end thereof; at least one discharge zone capable of receiving the irrigation liquid delivered through the opposite end of said at least one winding passage and controlledly discharging it outwardly of the laminate; and emitter opening provided on one of the faces of the laminate at said at least one discharge zone; an integrated filtration system for the irrigation liquid which comprises at least a thin slit for retaining solids, provided in said laminate at the face opposite the face containing said discharge opening and coincident with said at least one admission zone; and an integrated pressure compensating system comprising a non-supported area of said flat sheet, spanning at least one discharge zone, so that when the pressure in the pipe increases the non-supported area of said flat sheet acts as a compensating diaphragm by controlledly narrowing the cross sectional area of said at least one discharge zone in proportion to the increase of the pressure in the piping for carrying the irrigation liquid.

4,177,947

IRRIGATION DEVICE

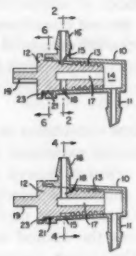
Stanley W. O. Menzel, Santee, Calif., assignor to Reed Irrigation Systems Pty. Ltd., Elizabeth, Australia

Filed Oct. 13, 1978, Ser. No. 951,111
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—542 **5 Claims**

1. An irrigation device with variable flow control comprising,

a hollow body closed at one end and open at the other end and having a first nipple and a second nipple spaced from each other along said hollow body, and within the body a rotatable key having a periphery which closely fits the hollow of the body and is inserted into the body from said other end and said key having an inner end terminating adjacent the closed end of the said hollow body to leave a space at said closed end of the body with which a passage in the first nipple communicates, the key having a channel formed therein which extends from said space to the periphery of the key remote from the said inner end and in

one rotational position of the key communicates with a passage in said second nipple, the key having a peripheral helical groove which communicates at one end with the



said space and at the other end with a channel which communicates with said passage of said second nipple when the key is in another rotational position, and means to removably hold the key in said body.

4,177,948

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES WITH INTERNAL MIXING

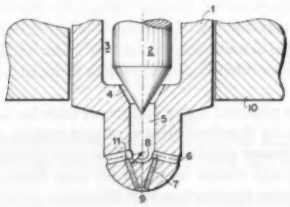
Wolfgang Schaffitz, Munich, Fed. Rep. of Germany, and Eugen W. Huber, deceased, late of Munich, Fed. Rep. of Germany (by Gerda A. O. Huber-Plitzold, Anke H. L. Huber, Christina G. E. Huber, heirs), assignors to Institut für Motorenbau Professor Huber Eingetragener Verein, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 778,211

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610927

Int. Cl.² B05B *1/30*

U.S. Cl. 239—533.3 **3 Claims**



1. A fuel injection nozzle for internal combustion engines with internal mixing, in which the fuel flows through an injection hole bore having an inlet and an outlet end to the combustion chamber under a high pressure upstream of the inlet end of said injection hole bore, and in which a constriction of the flow cross section of the fuel occurs in the injection hole bore in a region downstream from and adjacent to the inlet end of said injection hole bore due to a reduction of static pressure in said region, the flow cross section of the injection hole bore remaining the same as the flow of fuel through said nozzle is varied, characterized in that a communicating bore connecting the combustion chamber and the injection hole bore is formed to communicate with said region of said injection hole bore to convey gas from the combustion chamber into a space of relative sub-pressure surrounding the flowing fuel in said region.

4,177,949

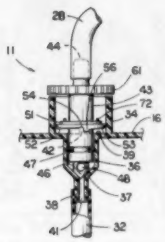
FOG GENERATING APPARATUS

Russell R. Curtis, Indianapolis, and Albert L. Schlensker, Westfield, both of Ind., assignors to Curtis Dyna Products Corporation, Westfield, Ind.

Filed May 19, 1978, Ser. No. 907,882

Int. Cl.² B05B *1/30*

U.S. Cl. 239—582 **4 Claims**



1. An adjustable metering valve for a fog generating apparatus of the type in which an electric motor-driven fan provides aspirating air movement drawing liquid at a relatively low flow rate from an adjacent liquid reservoir and delivering it to an atomizing means, said adjustable metering valve being adapted to control the flow of liquid from said reservoir to said atomizing means, said metering valve comprising a valve body having a central longitudinal bore with an inlet aperture at one end, a valve seat formed in said body adjacent the intake end of said bore and an annular transverse shoulder formed in said body encircling said bore and spaced from said inlet aperture, a hollow valve stem received within said bore and extending beyond said housing at one of its ends and cooperating with said valve seat at its other end, a transverse passage in said valve stem upstream of said valve seat and communicating with the interior of the valve stem, an annular flange on said valve stem adjacent said shoulder, cooperating cam elements on said shoulder and said stem flange comprising two camming surfaces each extending for approximately 180° of the flange surface and varying uniformly from a minimum to a maximum thickness in said approximate 180° extension, and two diametrically opposite abutments each engaging one of said cam surfaces, said cam elements being operative to axially displace said valve stem with relation to said valve seat between full closed and full open positions upon approximately 180° of rotation of said stem, and a member carried by the portion of said stem exterior of the housing for facilitating manual adjusting rotation of said stem within the housing.

4,177,950

CONTROL FOR A POWER PLANT COAL MILL PULVERIZER HAVING FEEDFORWARD DAMPER POSITIONING

William J. Smith, Verona, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

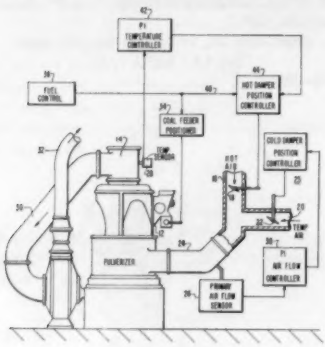
Filed Feb. 16, 1978, Ser. No. 878,614

Int. Cl.² B02C *25/00*

U.S. Cl. 241—33 **4 Claims**

1. A control for an electric power plant pulverizer mill having a variable speed feeder and hot and cold air ducts supplying primary air flow through said pulverizer under the control of respective hot and cold air dampers, said control comprising means for sensing the temperature of the mill outlet flow, means for sensing the primary air flow, means for generating a feeder speed demand, means for operating the feeder in accordance with the feeder speed demand, means for positioning the hot damper in accordance with a hot damper position demand, means for positioning the cold damper in accordance with a cold damper position demand, means for generating the damper position demands in response to said flow and tempera-

ture sensing means to control total primary air flow in accordance with a predetermined function and to control the mill outlet temperature in accordance with another predetermined



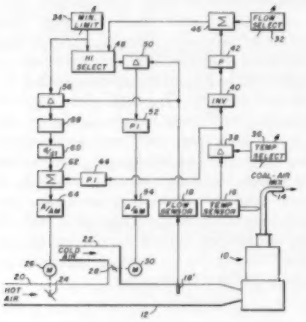
function, and means for applying the feeder speed demand to said damper position demand generating means to produce anticipatory movement of at least one of the dampers in response to feeder speed demand changes.

4,177,951

PULVERIZER AIR FLOW AND TEMPERATURE CONTROL

John A. Makuch, Granby, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Jun. 28, 1978, Ser. No. 919,756
Int. Cl.[2] B02C *25/00*
U.S. Cl. 241—35 **10 Claims**



1. A method for controlling the quantities of at least two constituents of a fluid mixture delivered to a mixing point in response to measured parameters of the mixture comprising the steps of:

selecting normal values for first and second parameters of the mixture;

selecting a desired minimum value for the mixture second parameter;

measuring the actual value of the mixture first parameter;

comparing the measured and selected normal values of the mixture first parameter;

adjusting the flow of the first constituent to compensate for any difference between the measured actual and selected normal values of the mixture first parameter when the mixture second parameter is above the selected desired minimum value;

modifying the selected value of the mixture second parameter as a function of any difference between the measured actual and selected normal values of the mixture first parameter;

measuring the actual value of the mixture second parameter;

comparing the measured and modified selected values of the mixture second parameter;

adjusting the flow of the second constituent to compensate for any difference between the measured actual and modified selected values of the mixture second parameter when the second parameter is above the selected desired minimum value;

adjusting the flow of the first constituent as a function of the rate of change of the second parameter when the second parameter is below the selected desired minimum value;

comparing the measured and actual selected desired minimum values of the mixture second parameter when the second parameter is below the desired minimum; and

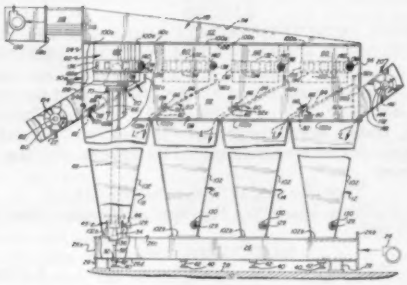
adjusting the flow rate of the second constituent to compensate for any difference between the measured actual and selected minimum values when the flow rate is below the selected minimum value.

4,177,952

IMPACT SCRUBBER

Leslie D. Rikker, Oak Forest, Ill., assignor to National Engineering Company, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,226
Int. Cl.[2] B02C *23/18*
U.S. Cl. 241—40 **32 Claims**



1. An impact scrubber for removing coating materials from the surfaces of particulate matter such as spent foundry sand and the like, said scrubber including one or more scrubber cells comprising:

a lift tube open adjacent upper and lower ends for containing a high velocity fluidized stream of said matter;

fluid injector means adjacent said lower end of said lift tube for moving said matter into said lift tube forming an upwardly flowing fluidized stream therein;

adjustable inlet valve means adjacent said fluid injector means for regulating the flow of said matter into said lower end of said lift tube;

target means spaced above the upper end of said lift tube providing an impact area for receiving the impact of said fluidized stream of matter and divering said matter and said coating materials removed therefrom in a generally downwardly extending annular curtain concentrically around said lift tube;

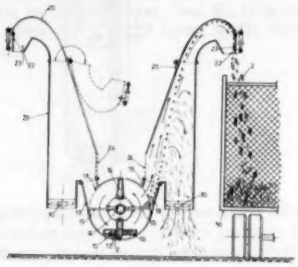
means for directing a secondary fluid flow outwardly of said lift tube at a level below and adjacent the open upper end for angularly intercepting said curtain of flowing matter and coating material and separating said coating materials away from said particulate matter; and

means for exhausting said separated coating materials along with said primary and secondary fluid separately away from said particulate matter.

4,177,953
CHOPPING-RAISING-CLEANING ASSEMBLY FOR SUGAR CANE HARVESTING MACHINES

Luiz Antonio C. Ribeiro Pinto, Ribeirão Preto, Brazil, assignor to Santal Equipamentos S. A. Comercio E. Industria, Sao Paulo, Brazil

Filed Mar. 29, 1978, Ser. No. 891,282
Claims priority, application Brazil, Aug. 26, 1977, 17705738; Nov. 30, 1977, 17707999
Int. Cl.² B02C *13/288*
U.S. Cl. 241—58 **25 Claims**



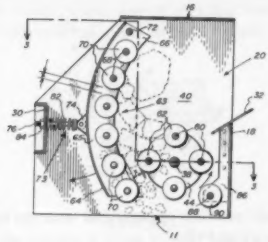
1. Chopping-raising-cleaning assembly for sugar cane harvesting machines of the cutting, chopping, cleaning and loading type, comprising a cylinder having an internal surface and provided with a central, longitudinal, horizontal, rotatably driven shaft, at least one radial fin having an external edge mounted on said shaft, at least the external edge thereof abutting the internal surface of the cylinder, said cylinder formed with an entrance opening substantially no higher than the level of the shaft to allow cane billets pre-cut by a suitable chopping mechanism, to be fed transversely to said shaft, said cylinder also formed with a tangential outlet opening for the billets and arranged to allow the billets fed to the cylinder to be launched outside the cylinder by the action of the fins in a generally vertical path, a billet discharge duct in communication with said tangential outlet opening to receive the discharged billets, said duct being bent upward and to one of the sides of the housing generally parallel to said central shaft, means mounting said duct for rotation of about 180° around a vertical axis passing through the center of said outlet opening, said duct formed adjacent its base with two opposed openings, fan means mounted externally of said duct for providing a forced transversal air stream through said opposed openings.

4,177,954
HAMMER-ROLL RECYCLING PLANT

Arlen J. Ostreng, Rte. 3, Robill Ct., Box 627, LaCrosse, Wis. 54601

Continuation-in-part of Ser. No. 771,013, Mar. 8, 1977, abandoned. This application Jan. 17, 1978, Ser. No. 870,064
Int. Cl.² B02C *13/28*
U.S. Cl. 241—167 **8 Claims**

1. An apparatus for crushing reinforced concrete and the like comprising:
a housing;
a rotor rotatably mounted within said housing and having an axis of rotation;
means for rotating said rotor;
a plurality of hammer cylinders;
means for rotatably mounting said hammer cylinders to said rotor so that no translational movement of the cylinder relative to the rotor is permitted;
said mounting means comprising a plurality of shafts fixed to said rotor assembly, each of said shafts having a longitudinal axis parallel to the axis of rotation of said rotor, said plurality of shafts being substantially equidistantly spaced circumferentially about said rotor;
each of said hammer cylinders having a length at least as great as its diameter;
a breaker bar assembly mounted to said housing a predetermined distance from said rotor and said hammer cylinders;

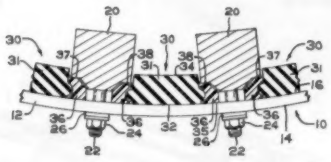


said hammer cylinders being rotatably mounted on said shafts with a sliding fit allowing only rotational movement of said hammer cylinders relative to said rotor.

4,177,955
MILL WEAR MEMBER

Larry G. Miller, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 2, 1978, Ser. No. 911,856
Int. Cl.² B02C *17/22*
U.S. Cl. 241—183 **4 Claims**



1. In a liner member for use in rotary drum type mills having spaced lifter bars at interior surface areas of the mill, which liner member is adapted for disposition between a selected pair of said lifter bars and comprises a resilient portion of vulcanized elastomeric material having a widthwise dimension substantially corresponding to the spacing between said selected pair of lifter bars, the improvement wherein said liner member further comprises a rigid plastic portion bonded along each longitudinal margin of said resilient portion.

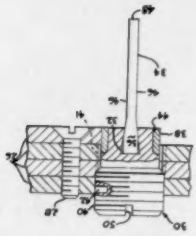
4,177,956
COMMINUTION MACHINE WITH PULVERIZING BLADE ASSEMBLY

William E. Fawcett, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Mar. 27, 1978, Ser. No. 890,530
Int. Cl.² B02C *13/28*
U.S. Cl. 241—188 A **7 Claims**

1. A blade assembly for pulverizing machines comprising; plug means having a slotted portion formed therein, blade means with one end disposed in said slot and another end extending away from said plug, shrinkable collar means for holding said blade and said plug in assembled relation, said walls of said slotted portion tapering outwardly from one another as they extend into said plug, said one end of said blade having sides that taper outwardly from one another as they

extend into said plug, said tapering sides and walls forming cooperating elements of abutment means so as to urge said one



end of said blade into firm engagement with the bottom of said slotted portion of said plug.

4,177,957

APPARATUS FOR CLAMPING A THREAD

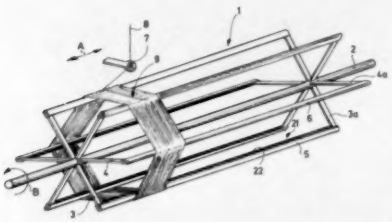
Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung, Mengen, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,888

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739535

Int. Cl.[2] B65H *54/56, 49/30*

U.S. Cl. 242—53 **6 Claims**



1. Apparatus for clamping a thread in a reeling machine, comprising a reeling cage which is rotatably mounted on a machine frame and comprises bars extending parallel to the axis of rotation thereof, and a thread laying device which is displaceable on the machine frame for laying of an incoming thread on the bars of the reeling cage, a strip-like first brush for clamping a thread between its bristles provided on at least one bar of the reeling cage and extending in the longitudinal direction thereof, a thread receiver which is displaceable between retracted and advanced positions on the machine frame transversely to the axis of rotation of the reeling cage, a second strip-like brush supported by the thread receiver for clamping the thread between the thread laying device and the reeling cage when the thread receiver is displaced to its advanced position, and an arm pivotally mounted on the thread receiver for pulling out a certain thread length between the second brush and the thread laying device when the thread receiver is displaced to its advanced position, which thread length, after the thread has been severed between the second brush and the laying device, the reeled thread has been removed and the thread receiver has been displaced to its retracted position, hangs in the path of the first brush and is clampable by the latter.

4,177,958

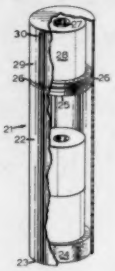
TOILET PAPER SERVICE PEDESTAL

Judith A. Poole, 746-8th Ave. S., S. Saint Paul, Minn. 55075

Filed Jun. 15, 1978, Ser. No. 915,928

Int. Cl.[2] A47K *10/22, 10/32*

U.S. Cl. 242—55.42 **2 Claims**



2. A toilet paper service pedestal comprising a hollow elongate body standing vertically on a base end in contact with the floor and being free to be moved laterally on the floor, a dense mass in the base end to stabilize the pedestal against toppling over, with a removable platform on the head end of the pedestal with a vertical spindle on the platform to hold a roll of toilet paper for dispensing short lengths of paper and with access through the removable platform for introducing and removing rolls of toilet paper to and from the hollow body.

4,177,959

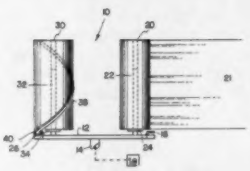
FLYING SPLICE APPARATUS AND PROCESS

William G. Lancaster, 5101 Upper River Rd., and Patrick R. Lancaster, III, 2606 N. Osage, both of Louisville, Ky. 40200

Filed Oct. 2, 1978, Ser. No. 947,828

Int. Cl.[2] B65H *19/18*

U.S. Cl. 242—58.2 **17 Claims**



1. An apparatus for effecting a flying splice of vertically positioned rolls of plastic film comprising a reel, means connected to said reel to rotate said reel, a plurality of roll supporting members mounted to said reel, at least one guide member mounted to said apparatus, a roll of plastic film mounted on each of said roll support members, at least one of said rolls being provided with an adhesive strip extending angularly across the surface of the leading edge of the film web with mounting means mounted to said angularly oriented adhesive strip, said mounting means being moveably mounted on one of said guide members, said reel when rotated bringing film dispensed from a lead roll into contact with the adhesive strip on the leading edge of another roll so that the leading edge of the film of the roll is carried off of the roll and said mounting means is carried off of said guide member.

10. A roll of plastic film adapted for use on vertically positioned rolls for effecting a flying splice comprising a roll of plastic film, the leading edge of said plastic film being cut

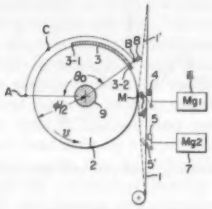
diagonally, an adhesive strip fastened along the edge of the diagonally cut film and tubular means mounted to said adhesive strip at the leading corner of said diagonally cut leading edge, said tubular means being spaced from said roll of film and oriented parallel to the bottom edge of said roll of film to receive a guide member.

4,177,960

AUTOMATIC PAPER SPLICING CONTROL DEVICE

Hiroshi Nakagawa, Yokohama, Japan, assignor to Tokyo Kikai Seisakusho Ltd., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,136
Claims priority, application Japan, Dec. 30, 1976, 51-159250
Int. Cl.[2] B65H *19/14;* B32B *31/00;* B65H *19/08*
U.S. Cl. 242—58.3 **5 Claims**



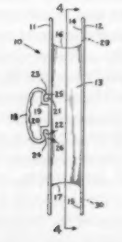
1. An automatic paper splicing control device for splicing the adhesive portion of a rotating roll paper with a travelling paper, comprising a depressing means for depressing the travelling paper against the roll paper and onto the part thereof having the adhesive and requiring a time T from its start of operation for causing the travelling paper to contact with the roll paper, pulse generating means for generating pulse signals having a frequency proportional to the revolutions of the roll paper, detecting means for detecting a predetermined position of the adhesive, counting means for counting the number of pulses generated by the pulse generating means during a time T and prior to the start of operation, and control means for modifying the time of occurrence of the start of operation of the depressing means in accordance with the contents counted by the counter during the time T, said detecting means being disposed at a position angularly separated from the position where the roll paper and travelling paper are spliced and in a direction opposite to the rotation of the roll paper, said angular separation corresponding to a maximum number of pulses generated during a time T by a roll paper of minimum diameter and maximum speed which is to be used, whereby the start of operation is delayed from said detecting means position.

4,177,961

EXTENSION CORD HOLDER

Manfred Gruenewald, Woodside, N.Y., assignor to Excel Plastic Products, Inc., Jersey City, N.J.

Filed Jun. 23, 1978, Ser. No. 918,642
Int. Cl.[2] B65H *75/36*
U.S. Cl. 242—85.1 **8 Claims**



1. An integrally molded Extension Cord Holder comprising;

a. spaced side members,

b. a substantially unitary elongated center section connecting said side members to each other having a length shorter than the side members to form spaced cord receiving recesses between the side members respectively at opposite ends of the Extension Cord Holder,

c. a handle connected to one of said side members, and

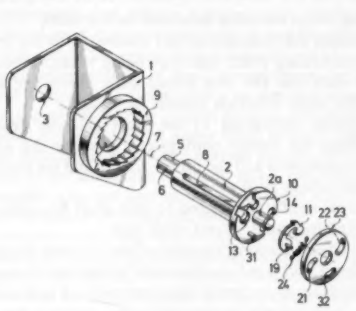
d. at least one locking recess formed by said handle.

4,177,962

WINDING-IN DEVICE FOR VEHICLE SAFETY BELTS

Eckhard Hildebrandt, 31 Bardseyring, 2359 Kisdorf, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 907,021
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722744
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 B **9 Claims**

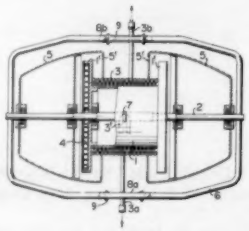


1. In a winding-in device for safety belts of motor vehicles, the device being of the type including a housing provided with a ring of teeth, a shaft having a flange, rotatably mounted in said housing for receiving a safety belt, a locking pawl pivotably mounted on said flange for engagement with said ring of teeth, an inertia body rotatable on and with said shaft, spring means for connecting said inertia body to said shaft, said inertia body, when a predetermined limiting level of acceleration of the shaft is exceeded, lags behind the rotary movement of said shaft in opposition to the effect of said spring means, so as to bring the locking pawl into engagement with said ring of teeth, the improvement which comprises, said inertia body having an actuating slot forming a cam track therein, and said locking pawl having first and second end regions connected by a web and being inset in said flange, the first end region being provided with a mounting head in the form of a part-disc, which disc is held against radial movement by a bearing space of a part-circular configuration forming part of a recess, said disc forming, in conjunction with said bearing space, a pivot mounting for connecting said locking pawl to said flange, one end of said bearing space continuing into a radial or substantially radial abutment face which forms a buttress for said locking pawl when the latter is in the locking position, said buttress being deformable under excessive loads, the second end region, which is opposite to said first end region, carrying an actuating pin, parallel to the axis of the device, which engages in said actuating slot in said inertia body, said actuating slot following a path along an arc of a circle eccentric to said inertia body.

4,177,963
CORD WINDING APPARATUS

Katsuhiko Takahashi, Tokorozawa; Masakazu Iikura, Tokyo, and Hachiro Doi, Minamisaitama, all of Japan, assignors to Fuso Keigokin Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,842
Claims priority, application Japan, Sep. 26, 1977, 52-115888
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.11 **5 Claims**



1. A cord winding apparatus for use in connecting an electro-motive apparatus to a power source comprising:

a shaft;

a winding drum rotatably mounted on the sahft;

a cord folded into two pieces and connected to the drum at the cord folding point, said cord being wound around the drum such that the two folded cord pieces are wound from the same direction around the drum;

spring means connected to the shaft and the drum for stretching the folded cord pieces between the electromotive apparatus and the power source and for rewinding the two folded cord pieces;

a fixed arm rigidly connected to said shaft for preventing rotating movement of said shaft; and

a pair of wheels flanking the sides of the winding drum so as to support said winding drum and which are mounted on said shaft so as to rotate independently of said winding drum, said wheels sandwiching the winding drum between the two wheels and each wheel having a substantially cup-like shape so as to stablize said cord winding apparatus.

4,177,964
DOCKING SYSTEM FOR SPACE STRUCTURES

Edward J. Hujsak, La Jolla, and LeRoy E. Siden, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Sep. 8, 1978, Ser. No. 940,538
Int. Cl.[2] B64G *1/00*
U.S. Cl. 244—161 **8 Claims**

1. A system for joining large structures in space which comprises:

a concave generally conical receiving means on one structure;

a rounded socket at the apex of said conical receiving means;

a convex generally conical extending means on a second structure;

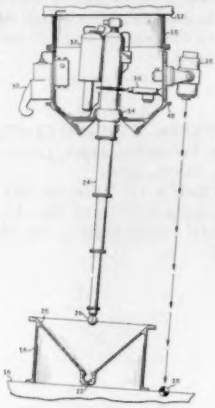
an extendable and retractable boom extending out from the apex area of said convex means;

said boom being movable about a spherical bearing at the point where said boom passes through said convex means;

means for guiding the end of said boom towards said socket as said structures approach each other;

means for locking said boom end in said socket upon entry of said end thereinto;

means for retracting said boom whereby said structures are drawn toward each other and said concave and convex means are brought into engagement; and

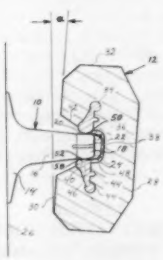


latch means for holding said convex and concave means in engagement.

4,177,965
SOAP BAR AND HOLDER

Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48075

Continuation of Ser. No. 718,183, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,706, Jun. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 392,817, Aug. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 274,641, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 93,000, Nov. 27, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,859
Int. Cl.[2] C11D *17/04*
U.S. Cl. 248—359 **10 Claims**



1. In combination, a soap bar having a pair of opposed faces spaced apart a distance substantially less than the lateral extent of said faces, an insert formed of a water insoluable material embedded in said soap bar and firmly bonded thereto at the interfaces of the soap bar and the insert, said soap bar having a socket therein of generally circular cross section extending from said insert to one of said opposed faces, said insert having a lateral dimension greater than the diameter of the inner end of said socket and being oriented in the soap bar so that it is spaced inwardly from both of said opposed faces and so that its lateral dimension lies in a plane generally parallel to the lateral dimension of the soap bar, said insert having a cavity therein of circular cross section, the axis of which is perpendicular to the plane of the lateral dimension of the soap bar, said insert having an end wall at the axially inner end of the cavity and having a circular opening axially opposite said end wall which is concentric with the axis of the cavity, said opening providing a

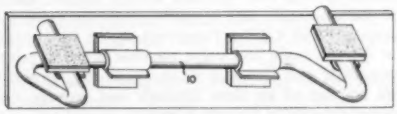
passageway between the inner end of the socket and the cavity, said opening being concentric with the axis of the socket and having a diameter smaller than the lateral dimension of the socket at the inner end thereof so that the line of junction between the inner end of the socket and the insert is spaced radially outwardly of said opening and radially inwardly of the periphery of the insert, the axial dimension of said insert between said line of junction and the interface between said end wall and the soap bar being less than the lateral dimension of the insert, and a holder for the soap bar having a base adapted to be affixed to a support surface and having a shank fixed to and extending from said base so that the shank extends generally perpendicular to the support surface on which the base is affixed, said shank having a head at the free end thereof, said head being sized for removable insertion into said cavity through said opening, said head having an axial dimension corresponding generally to the axial dimension of the cavity from said opening to said end wall, the axial dimension of the portion of the shank extending from said base to said head being substantially greater than said axial dimension of said head to provide ample clearance for enabling the user to wrap his fingers around the soap bar and rub them across said one face when said head is inserted into said cavity, the outer periphery of said head defining a generally cylindrical bearing surface concentric with the axis of said shank, said cavity defining a generally cylindrical bearing surface concentric with the axis of said opening and extending between said end wall and said opening, the diameters of said bearing surfaces being dimensionally related at axially spaced sections thereof so that, when the head is fully inserted into said cavity, the bearing surfaces interengage such that the soap bar is substantially incapable of being tilted relative to the shank of the holder and, when the head is less than fully inserted into said cavity, the soap bar is loosely and tiltably retained on the holder.

4,177,966

MIRROR ASSEMBLY USING MIRROR, CLAMPS AND STANDOFF AXLES

Edgar Astrove, 35 Stratton Rd., Scarsdale, N.Y. 10583

Filed Jun. 5, 1978, Ser. No. 912,336
Int. Cl.[2] A47G *1/17*
U.S. Cl. 248—467 **6 Claims**



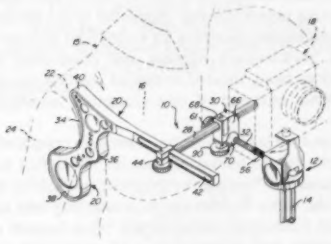
1. A mirror assembly characterized by:
(a) an elongated mirror having a viewing surface and a back surface;
(b) first and second mirror clamps attachable to the back surface of said mirror;
(c) first and second windscreen clamps attachable to a mounting surface such as the inside of a windscreen; and
(d) a set of standoff axles including first and second axle portions alignable to a single axis and having a multiplicity of bends forming first and second standoff portions essentially normal to the first and second axle portions respectively, and first and second hanger portions each lying within a plane nominally normal to the planes formed by first axle portion and first standoff portion and by second axle portion and second standoff portion;
said first mirror clamp and said second mirror clamp clamping by a physical force said first and second axle portions permitting rotational movement of said mirror upon application of rotational force, and said first and second windscreen clamps clamping by a physical force said first and second hanger portions.

4,177,967

GUIDANCE ARM FOR TRIPOD APPARATUS

L. Mark Marchus, 123 NW. 2nd St., Ste. 209, Portland, Oreg. 97209

Filed Oct. 31, 1977, Ser. No. 847,401
Int. Cl.[2] F16M *11/04*
U.S. Cl. 248—178 **13 Claims**



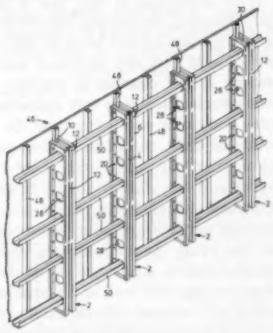
1. Apparatus for controlling a universal movement head of support means as a result of movement of an individual using the support means, said support means for substantially stably supporting the universal movement head and any device such as a camera attached thereto independently of the individual using the support means, comprising in combination:
control means for controlling movement of the movement head independently of hand movement of the individual, said control means comprising an arm grip structure having a generally planar contact portion extending generally parallelly between the upper torso and the upper arm of the individual, the contact portion defining an arm contact area of sufficient size to firmly retain the contact portion parallel with and against the upper torso with only upper arm pressure thereagainst; and
connection means for operatively connecting said control means to the movement head and adapted for positioning said control means with respect to said movement head to maintain continuous contact of said control means with a portion of the upper torso during movement of the individual using said apparatus.

4,177,968

CONCRETE FORMWORK SOLDIER

David Chapman, Bradford on Avon, England, assignor to Acrow (Engineers) Limited, London, England

Filed Aug. 29, 1977, Ser. No. 828,630
Int. Cl.[2] E04G *17/04*; E04C *3/30*
U.S. Cl. 249—211 **6 Claims**



1. A concrete formwork soldier for use with concrete formwork, said soldier comprising
two elongated members positioned parallel one to the other,

each of said members having a generally U shaped cross-sectional configuration, said members being positioned in back-to-back relation with side flanges of said members extending away one from another, and said members being positioned to establish a space between backs of said members, and

a plurality of connecting members positioned between the backs of said elongated members within said space, each connecting member being connected to the backs of both of said elongated members for restraining said members in spaced, back-to-back relation, said connecting members themselves being located in spaced relation one from the other from one end of said elongated members to the other,

opposite ends of said connecting members cooperating with the backs of said elongated members to define two separate channels extending the length of said soldier from one end to the other end for use in connecting said soldier to concrete formwork, said channels being located opposite one another and separated by said connecting members, each of said channels being located inwardly of the side flanges of said members within said space established between backs of said members.

4,177,969

FLOW CONTROL DEVICE

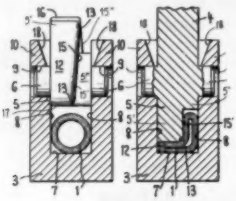
Paul Sieber-Müller, Ebenen, 3703 Aeschi b. Spiez, Berne, Switzerland

Filed May 3, 1977, Ser. No. 793,140

Claims priority, application Switzerland, May 3, 1976, 5424/76

Int. Cl.[2] F16K *7/06*

U.S. Cl. 251—9 **5 Claims**



1. A flow control device for controlling the rate of flow of fluid passing through flexible tubing, comprising: a body member comprising a flat bottom and two substantially parallel spaced flat side walls defining a channel for receiving a flexible tubing, said side walls having a pair of axially aligned bearings respectively, a lever including at one end a semi-circular clamping disk for collapsing the tubing, and pivot means supporting said one end portion of said lever in said bearings for pivotal operation of said disk for clamping and selectively collapsing the tubing in said channel to regulate flow therethrough, said semi-circular clamping disk including a substantially semi-circular body of a width less than the spacing between said channel side walls, and a hub portion on at least one side of said semi-circular body and jointly therewith equaling the spacing between said side walls to snugly fit said lever one end portion within said channel body, said semi-circular body having a semi-circular perpheral press surface concentric with said pivot means and being spaced from said channel bottom wall, when in facing relation, a distance substantially equal to the double thickness of the tube wall to collapse and close the horizontal branch of an L-shaped collapsed tube, one generally radial side wall of said semi-circular body being spaced by said hub from the adjacent channel side wall a distance substantially equal to the double thickness of the tube wall and having a configuration to progressively collapse and close the vertical branch of an L-shaped collapsed tube.

4,177,970

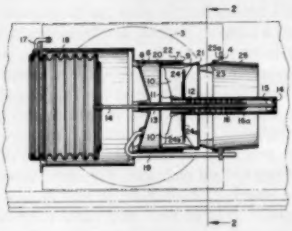
VALVE ASSEMBLY FOR USE IN AN AIR DISTRIBUTION SYSTEM

Harry K. Ring Jr., La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed May 12, 1978, Ser. No. 905,311

Int. Cl.[2] F16K *31//126*

U.S. Cl. 251—61.3 **6 Claims**



1. A valve assembly for use in an air distribution system comprising

a. a plenum chamber having an inlet opening and an outlet;

b. conduit means for admitting air to said plenum chamber through said inlet opening and including a generally cylindrical sleeve having at least a portion thereof disposed within said plenum chamber, said portion including aperture means passing radially therethrough for providing communication between the interior of said sleeve ar 1 the interior of said plenum chamber;

c. a closure member disposed at the end portion of said sleeve downstream from said aperture means for blocking axial air flow;

d. a generally cylindrical valve member disposed within said sleeve and including an axially extending portion disposed adjacent but slightly spaced from the inner pheripheryy of said sleeve, said valve member further including passage means extending between its axial ends for providing communication therebetween to thereby substantially balance the axial pressure forces to which it is subjected;

e. mounting means for supporting said valve member for axial movement between a first position substantially coextensive with said aperture means, thereby blocking flow therethrough; and a second position substantially non-coextensive with said aperture means for permitting flow therethrough; and valve member when in positions intermediate said first and second positions permitting a small amount of air flow through said passage means, between the axially extending portion of said valve member and the inner periphery of said sleeve, and through said aperture means; whereby an axial force is imposed upon said valve member in a direction urging same toward said first position;

f. force balancing means connected to said valve member to counteract said axial force, said force balancing means comprising

i. a generally planar member disposed within said passage means so as to restrict said small amount of air flow therethrough ,whereby a relatively low pressure area is created downstream of said valve member; and

ii. said generally planar member being connected to said valve member and including a first generally planar surface defining a first axially projected area subjected to the relatively high pressure area upstream from said valve member and a second opposite generally planar surface defining a second axially projected area subjected to the relatively low pressure area downstream from said valve member ,whereby a force is imposed on said valve member in a direction urging same toward said second position to thereby at least partially counteract said axial force; and

g. actuator means drivingly connected to said valve member

for selectively positioning same between said first and second positions.

6. The valve assembly of claim 1 wherein said actuator means include

a. diaphragm means disposed adjacent said closure member for receiving a control air pressure signal derived from air pressure present in said air distribution system; and

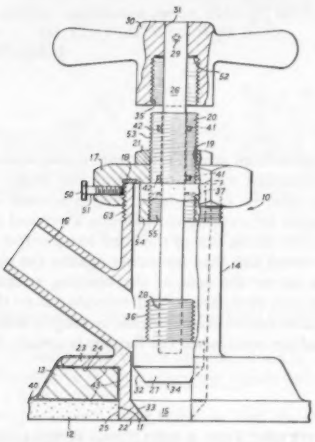
b. means connecting said diaphragm means to said valve member whereby said valve member may be selectively positioned between said first and second positions.

4,177,971

SEA COCK VALVE

Leslie E. Landamore, Salhouse, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed May 18, 1977, Ser. No. 798,109
Int. Cl. F16k *31/50*
U.S. Cl. 251—215 **8 Claims**



1. A valve comprising:

a hollow valve body;

a valve opening in said valve body;

a valve seat in the said valve body around said valve opening;

closure means closing the valve body at the end opposite the valve opening;

a spindle opening in said closure means;

a valve member movable towards and away from said valve seat to open and close said valve;

a spindle carrying said valve member and extending through the said spindle opening;

first screw-threaded means on the closure means of the valve body to the outside of said valve body;

second screw-threaded means fixed on the spindle outside said valve body and adapted for mating with said first screw-threaded means on said closure means of the valve body to hold said valve member against said valve seat;

third screw-threaded means on the closure means of the valve body, to the inside of said valve body;

fourth screw-threaded means on said spindle inside said valve body and adapted for mating with said third screw-threaded means on said closure means of the valve body to the inside of the valve body for holding said valve member away from said valve seat, said spindle being slidable axially in said spindle opening between the position in which the first and second screw-threaded means engage and the position in which said third and fourth screw-threaded means engage; and

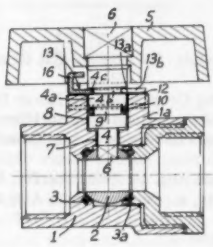
sealing surfaces carried on the closure means and on the said spindle which engage when the said third and fourth screw-threaded means engage to form a seal around the spindle opening.

4,177,972

COCKS HAVING ROTATING MANIPULATION SPINDLES

Andre' Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-La-Ferriere, France

Filed Dec. 2, 1976, Ser. No. 747,042
Claims priority, application France, Dec. 18, 1975, 75 38893
Int. Cl.² F16K *51/00*
U.S. Cl. 251—288 **14 Claims**



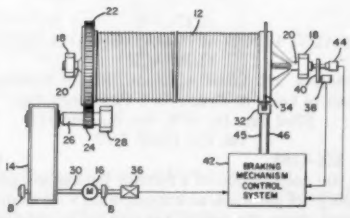
1. A cock comprising a body, a spherical shut-off member rotatably mounted in the body, a spindle connecting said shut-off member to an external manipulation member, the body having a planar support surface, a locking member bearing against said planar support surface, said locking member having a notch which engages in a neck of the spindle, the shoulder of which is flush with the level of said planar surface, the surface of said locking member bearing against said planar surface of the body, said planar support surface of the body having two flanges which engage with the edges of the locking member, the locking member of the spindle is formed by a planar plate which extends across the entire diameter of said body, said planar plate having two turned down parallel edges which form two grooves into which there engage said flanges provided on the body of the cock to either side of planar support surface, and wherein the manipulation spindle comprises a circular neck wherein there are engaged the edges of the notch of the locking member, one of the surfaces of the neck forming the bearing shoulder.

4,177,973

CABLE DRUM SAFETY BRAKE

Gregory C. Miller, Federal Way; Henry R. Albrecht, Seattle; C. William Clarke, Seattle, and Paul L. Longthorpe, Seattle, all of Wash., assignors to Ederer Incorporated, Seattle, Wash.

Filed Mar. 6, 1978, Ser. No. 883,539
Int. Cl.² B66D *1/48*
U.S. Cl. 254—173 R **8 Claims**



1. A safety system for preventing rotation of a cable drum in response to failure or overload condition of a drive train hav-

ing a speed reduction ratio, said cable drum being driven by a prime mover through said drive train, said safety system, comprising:

sensing means having an output for measuring the rotation of said prime mover with respect to the rotation of said cable drum;

braking means for preventing rotation of said cable drum responsive to a drive train failure or overload indication; and

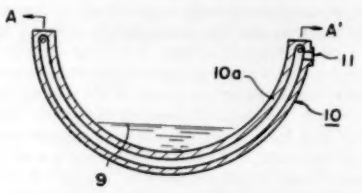
detection means receiving the output of said sensing means for generating said drive train failure or overload indication when said condition occurs when the rotation of said prime mover relative to the rotation of said cable drum deviates from a predetermined relationship which corresponds to the speed reduction ratio of said drive train.

4,177,974

MOLTEN SLAG RUNNER FOR BLAST-FURNACE PLANT

Masaaki Higuchi; Genji Nakatani; Haruo Ito; Masamichi Matsuda, all of Fukuyama, and Yoshinori Suetake, Kasaoka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,503
Claims priority, application Japan, Aug. 17, 1977, 52-97825
Int. Cl.[2] C21B *7/14*
U.S. Cl. 266—196 **4 Claims**



1. In a molten slag runner for conducting a stream of molten slag from a blast furnace to another place, the improvement wherein:

(a) at least part of said runner is composed of a plurality of trough elements arranged in series and subjected to forced cooling;

(b) each of said trough elements comprises a hollow body made of copper or copper alloy; and

(c) said hollow body comprises a plurality of partition walls alternately arranged parallel to one another to define throughout a space within said hollow body a series of zigzag passages disposed to flow a cooling medium without stagnation, wherein the spacing of said partition walls in the lower portion of said trough element is smaller than that of said partition walls in the upper portion of said trough element and inlet port means and exhaust port means connecting the ends of said series of passages to external cooling medium supply and exhaust pipe means.

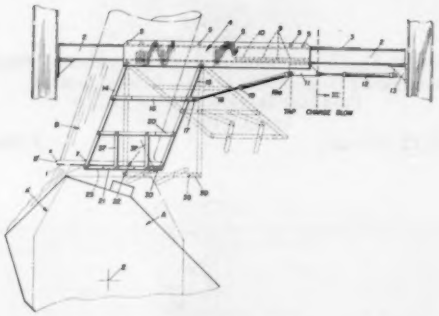
4,177,975

EXHAUST HOOD APPARATUS WITH TILTING FURNACE

Leo J. Meyers, and Louis A. Grant, both of Pittsburgh, Pa., assignors to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Jun. 14, 1978, Ser. No. 915,511
Int. Cl.[2] C21B *7/22*
U.S. Cl. 266—158 **12 Claims**

10. In the combination of a furnace having an open top for the discharge of gases and an exhaust hood with an open lower end spaced above the top of the furnace to receive exhaust gases from the furnace, the furnace being arranged to tilt from an upright position where the open top of the furnace is substantially centered under the open bottom of the hood to the right and to the left of the centered position, the open lower end of the hood being of an area to collect gases emerging from the top of the furnace when it is in the upright position or tilted to its full limit to one side or the other of the upright position, the improvement comprising an apparatus having a panel unit which will cover most of the bottom opening of the hood except that area which is over the right end of the furnace when the furnace is tilted to the right and all except the left side of the hood opening when the furnace is tilted to the left, said apparatus comprising a frame positioned above the lower



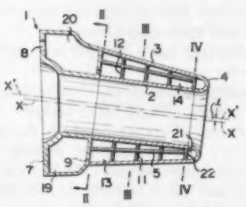
end of the hood from which said panel is suspended, a selectively operated first means for shifting the frame and panel horizontally relative to the hood, and a second selectively operated means for moving the panel in a vertical arc from a starting position at one side of the hood to a position below the level of the hood and then upwardly against the open end of the hood to cover the area of the opening selected by the operation of said first means, and returning it to the starting position, said second operating means serving to hold the panel at one side of the hood when the furnace is centered under the hood.

4,177,976

TUYERE FOR A MELTING FURNACE

Hiroshi Obata; Takehisa Hasegawa; Hideto Watanabe, all of Kurashiki; Kiyohiro Ikegawa, Nara, and Toshiyuki Ashida, Matsubara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Kurimoto Iron Works, Ltd., Osaka, both of, Japan

Filed Jul. 13, 1978, Ser. No. 924,383
Int. Cl.[2] C21B *7/16*
U.S. Cl. 266—266 **3 Claims**



1. A tuyere for a melting furnace, which comprises inner and outer walls forming a water cooling space therebetween; a cylindrical intermediate wall dividing said water cooling space into an inner water cooling chamber and an outer water cooling chamber, whereby the cooling water is introduced into the outer water cooling chamber from the outside of the furnace, circulated into the inner water cooling chamber from the inner end portion at the furnace side of the outer water cooling chamber and discharged from the outer end portion of the inner water cooling chamber; a guide wall disposed at least in the outer water cooling chamber so as to form a helical passage

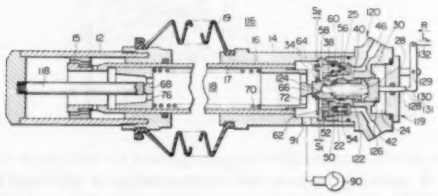
for the cooling water; said cylindrical intermediate wall having a circular cross-section and the central longitudinal axis thereof being offset from said inner and outer walls toward the side of said outer wall which is subjected to a relatively high heat load, whereby the space between a portion of the outer surface of said intermediate wall and the inner surface of said outer wall at the high heat load side of said outer wall is narrower than the space between these surfaces at other portions of said helical passage, and the cross-sectional area of said helical passage at said high heat load side is smaller than the cross-sectional areas of said other portions of said helical passage.

4,177,977

HYDROPNEUMATIC SUSPENSION UNIT WITH A LEVEL SELECTOR MECHANISM

Tomoyoshi Sekiguchi, Atsugi, and Masayuki Fujii, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 16, 1978, Ser. No. 878,425
Claims priority, application Japan, Feb. 17, 1977, 52/16589
Int. Cl.[2] F16F *9/06, 9/44, 9/50*
U.S. Cl. 267—64 R **8 Claims**



1. A hydropneumatic suspension unit for a wheeled vehicle, comprising

first and second bodies which are connected to each other movably relative to each other and which define therebetween a first chamber,

a gas spring communicating with said first chamber,

inlet passage means communicating with said first chamber,

outlet passage means communicating with said first chamber,

an inlet valve for normally closing said inlet passage means and for opening said inlet passage means for causing supply of pressurized hydraulic fluid into said first chamber,

an outlet valve for normally closing said outlet passage means and for opening said outlet passage means for causing exhaust of hydraulic fluid from said first chamber,

first and second pistons which each are slidably fitted in said second body and which face each other and which define therebetween a second chamber;

said valves being movable relative to said pistons,

orifice means defining a restricted passage providing communication between said first and second chambers,

first biasing means for urging said first and second pistons in opposite first and second directions,

second biasing means for urging said first piston in said second direction,

a valve actuator connected to said first piston for causing said inlet valve to open said inlet passage means in response to movement of said first piston in said second direction in excess of a predetermined distance and for causing said outlet valve to open said outlet passage means in response to movement of said first piston in said first direction in excess of a predetermined distance, and

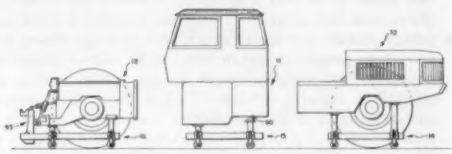
operating means for normally preventing said second piston from being moved in said second direction integrally with said first piston by said second biasing means and for, when it is desired to lengthen said suspension unit, allowing said second biasing means to move said first and second pistons in said second direction and for, when it is desired to shorten said suspension unit, moving said first and second pistons in said first direction.

4,177,978

UNIVERSAL SHOP STAND WITH BREAKDOWN FEATURE

Arthur J. Warsaw, 131 E. Main St., Colfax, Ill. 61728

Filed Apr. 3, 1978, Ser. No. 892,994
Int. Cl.[2] B66F *5/04*
U.S. Cl. 269—17 **9 Claims**



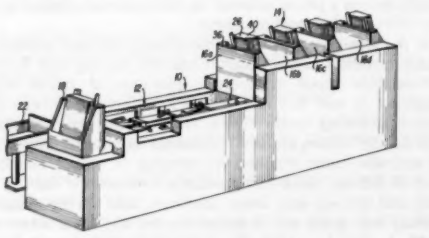
1. A shop stand comprising: first and second elongated side rails; first and second end frame means,each frame means including upright guide means and an extension received in said guide means for sliding adjustment in a vertical direction; means for locking each of said extensions to its associated guide means in an adjusted vertical position, said guide means of each end frame means being independently adjustable; first and second releasable clamp means for securing said first end frame means to said rails at an adjusted axial position, said clamp means being slidable along said rails in a loosened position; third and fourth releasable clamp means for mounting said second end frame means to an adjusted axial position on said rails; said third and fourth releasable clamp means mounted to said guide means of said second end frame means at a vertically offset position relative to a horizontal center line thereof, whereby said second end frame means may be mounted either in a relatively high or a low position in respect of said side rails using said third and fourth clamp means; said extension of said second end frame means being telescopically received in either end of said guide means therefor and being independently adjustable relative to said guide means whether said guide means is mounted in said high or low positions; and wheel support means carried by each of said clamp means.

4,177,979

SIGNATURE GATHERING MACHINE

Winston A. Orsinger, Nazareth, and George Fallos, Easton, both of Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Filed Feb. 23, 1978, Ser. No. 880,525
Int. Cl.[2] B65H *39/045*
U.S. Cl. 270—54 **10 Claims**



1. A signature gatherer machine comprising:

a plurality of spaced hoppers arranged in a line, each hopper containing a stack of signatures;

a frame on which said hoppers are mounted,

a signature conveyor having a plurality of spaced pockets positioned parallel to said line of hoppers;

each of said hoppers including a dispensing means for repetitively engaging a signature from its stack of signatures, separating said signature from other signatures in said stack, and delivering said signature to one of said pockets on said signature conveyer;

said frame including hopper-mounting means for mounting said hoppers on said frame at any of a plurality of overlapping positions which are offset from adjacent positions along said frame by a distance which is significantly less than the widths of said hoppers and for selectively allowing independent relative movement of said hoppers along said frame to all said overlapping positions for adjusting the overall operation of said signature gatherer machine;

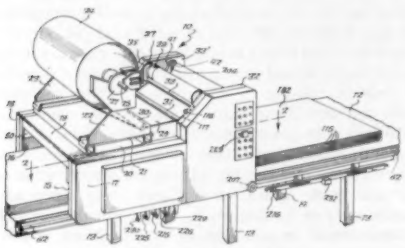
a power source and a variable-length linkage means for providing power to said hoppers at all said overlapping positions, said variable-length linkage means having an adjustable variable effective length from said power source to each of said respective hoppers for providing power from said power source to each of said hoppers at all said overlapping positions to which said hoppers are movable.

4,177,980

CLOTH-LAYING MACHINE

Albert Melega, Malverne, N.Y., assignor to Cutting Room Appliances Corporation, Hicksville, N.Y.

Filed May 23, 1977, Ser. No. 799,136
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—31 **10 Claims**



1. A cloth-laying machine comprising first and second side frame members, cross frame means for joining said first and second side frame members, a plurality of driven wheels mounted on said first and second side frame members, drive means including motor means for positively driving each of said driven wheels, guide wheel means mounted relative to one of said side frame members for running on a track member, and switch means mounted proximate said guide wheel means for deenergizing said motor means in the event said guide wheel means moves a predetermined vertical amount relative to said one of said side frame members.

4. A cloth-laying machine comprising first and second side frame members, cross frame means for joining said first and second side frame members, a plurality of driven wheels mounted on said first and second side frame members, drive means including motor means for positively driving each of said driven wheels, guide wheel means mounted relative to one of said side frame members for running on a track member, a pair of driven load-bearing wheels mounted on each of said first and second side frame members, and spring means for biasing said guide wheel means toward said track member.

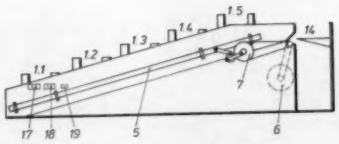
10. A cloth-laying machine comprising a frame, a plurality of wheel means for moving said frame on a cloth-laying table, motor means for driving said wheel means, brake means for stopping said machine, first means for actuating said brake means during normal operation, second means for actuating said brake means in the event said first means fail to function, guide wheel means for engaging a track, and switch means actuatable by said guide wheel means for stopping said machine in the event said guide wheel means moves a predetermined vertical amount relative to said frame.

4,177,981

COLLATING METHOD AND MACHINE

Michael Maul, Schwabach near Nürnberg, Fed. Rep. of Germany, assignor to Maul Lochkartenkeräte GmbH, Schwabach, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,334
Int. Cl.[2] B65H *39/055*
U.S. Cl. 270—58 **6 Claims**



1. A collating method, the method being of the type in which M groups of copies are received for collation, the M groups being in a predetermined sequence, each of the M groups consisting of N copies, the N copies within each individual group being the same, the copies in different ones of the M groups being different, the method being of the type wherein the M groups of N copies each are to be converted into N sets, each set containing M copies, the M copies within each individual set each coming from a different respective one of the M groups and being arranged in the set in said predetermined sequence,

the method comprising

subjecting a number M of groups of N copies per group to plural successive collating operations,

each of the collating operations being performed by laying all the copies of the M groups of N copies per group into a number of infeed bins lower than the number M, then in a cyclical sequence transferring individual copies from successive ones of the infeed bins to an outfeed bin until all of the copies of the M groups of N copies per group have been transferred from the infeed bins to the outfeed bin,

all of the copies of the M groups of N copies per group accordingly participating in each one of the plural successive collating operations, and each individual copy in the total number of copies in the M groups of N copies per group accordingly passing from an infeed bin to the outfeed bin once per collating operation and therefore a plurality of times during the performance of the plural successive collating operations,

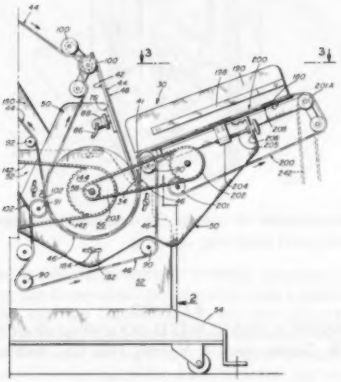
the second and any subsequent collating operation being each performed by taking the copies stacked in the outfeed bin and reintroducing them into infeed bins for performance of another collating operation,

the number of successive collating operations performed being such that upon completion of the last of the plural collating operations the outfeed bin has received the desired N sets of M copies each with the M copies in each of the N sets being in said predetermined sequence within the respective set.

4,177,982
SHEET FEEDERS

Elmer Bewersdorf, Downers Grove; James F. Cosgrove, Western Springs; Thomas R. Flavin, Mokena; Edward Gallagher, Oak Lawn; William B. McCain, Hinsdale; Ronald W. Weller, Oak Lawn, and Lawrence J. Werstler, Evergreen Park, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Feb. 24, 1977, Ser. No. 771,657
Int. Cl.[2] B65H *5/22*
U.S. Cl. 271—5 **32 Claims**



1. A machine for loading a hopper with sheets while concurrently riffling the sheets, comprising:

(A) a supply station having a support means on which the sheets are to be first stacked on edge, substantially in a front-to-rear horizontal stack;

(B) a stop plate at the front of said support means and cooperating therewith to define a downwardly opening feed gate into which the sheets are to be fed, said plate having a manifold thereon adapted to be connected to a source of vacuum;

(C) a sheet stripper means of endless belt form positioned to traverse said manifold while engaging the leading sheet of the stack, said stripper means having repeating spaced rows of openings therein which, by the motion of the stripper, are successively valved and unvalved to the source of suction as they traverse said manifold, whereby the stripper is effective to extract the leading sheets of the stack successively by a suction grip and advance them one by one into said gate in overlapping relation;

(D) riffle feed belts positioned at the gate to capture the extracted sheets, said feed belts being supported and guided to form a first bend around which the overlapped sheets are fed; and

(E) transfer means to transfer the overlapped sheets from said bend to the hopper.

4,177,983
DEVICE FOR PICKING UP, DEPOSITING AND TRANSPORTING THIN METAL FOILS BY MEANS OF A VACUUM LIFTING DEVICE

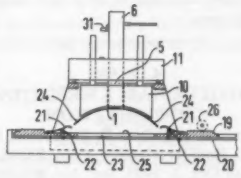
Manfred Wossler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 863,042
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659421
Int. Cl.[2] B65H *5/10*
U.S. Cl. 271—268 **10 Claims**

10. A system for picking up, depositing, and transporting thin foils to a foil processing station, comprising:

(a) a foil receiving station comprising a planar surface with a foil to be picked up resting thereon;

(b) a vertically movable vacuum lifting device means for positioning over a central region of the foil to be picked up and for suspension of the foil from said central region by suction, edges of the thin suspended foil bending downwardly in curved fashion by gravitational attraction, said



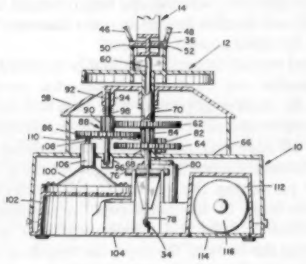
vacuum lifting device means including a separately movable curving means for causing additional downward curving of the suspended foil; and

(c) traverse means for moving the device means and suspended foil from the receiving station to a foil depositing station, said foil depositing station comprising means for supporting the foil in a flat position when the vacuum lifting device releases the foil.

4,177,984
CAPTIVE FLYING TOY AIRPLANE HAVING SIMULATED MOTOR SOUNDS

Raymond J. Douglas, Carson; Ference Fekete, Huntington Beach; Derek J. Gay, Rancho Palos Verdes; Gary L. Hunter, Fountain Valley, and Nicol S. Wilson, Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 17, 1978, Ser. No. 878,853
Int. Cl.[2] A63H *17/34, 27/04*
U.S. Cl. 272—31 A **4 Claims**



1. A captive flying toy comprising:

a pylon having a turntable configured for rotation about a first axis;

a boom member having first and second ends;

means coupling said boom member to said turntable for pivoting about a second axis generally transverse to said first axis;

a toy member secured to one of said first and second ends of said boom member;

a counterweight member secured to the other of said first and second ends of said boom member;

a rod member extending through said turntable, one end of said rod member engaging said boom member;

electrically operated drive means for rotating said turntable, said drive means including at least one gear member coupled for rotation about said rod member and another gear member in said drive means, said another gear member having a circumferential ratchet surface;

a sound cone mounted within said pylon and having the apex portion thereof engaging said ratchet surface for emitting a sound having a frequency proportional to the speed of rotation of said another gear member;

a bell crank member engaging the other end of said rod member for displacing said rod member axially for pivoting said boom member against the force of said counterweight; and

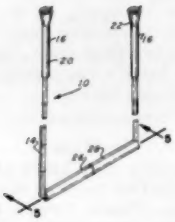
a control member coupled to said bell crank member for pivoting the same.

4,177,985

JUMP ROPE WITH VARIABLE WEIGHTING AND ROPE CONFIGURATION

Richard S. Hlasnicek, and Jean F. Hlasnicek, both of Jamestown Star Rte., Boulder Heights, Colo. 80302

Filed Oct. 3, 1977, Ser. No. 838,917
Int. Cl.[2] A63B *5/20*
U.S. Cl. 272—75 **7 Claims**



1. An improved jump rope of the kind having a flexible core extending continuously between handles on each of the opposite ends of the rope to form the body thereof, and having a plurality of elongated tubular segments slidable over the core between the handles, the segments having substantially similar inner diameters for non-telescoping adjacent positioning along the length of the core, wherein the improvement comprises:

(a) each of said handles having an outer diameter larger than that of the tubular segments; and

(b) first and second sleeves, one slidably mounted on each of said handles and covering a substantial portion of the handle for hand engagement with each said handle means on the outer end thereof to prevent the associated sleeve sliding off the outer end thereof, each sleeve having an inner diameter larger than the outer diameter of the handle for permitting the sleeves to be selectively slidable onto the body of the jump rope to positions near the center thereof over said tubular segments for centrally weighting the body of the rope, the length of each sleeve being greater than the length of each elongated segment for holding the segments in alignment through a portion of the body longer than the length of an individual segment.

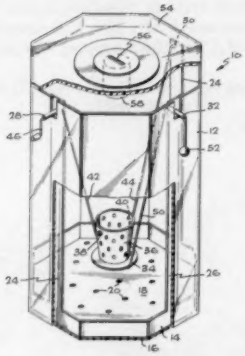
4,177,986

COIN DROP GAME

Gene E. Campbell, 327 Stepney St., Inglewood, Calif. 90305

Filed Jun. 28, 1977, Ser. No. 810,897
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 L **5 Claims**

1. A game of the class described comprising a container, said container having a coin receiving opening at one end, a coin receiving basket adjustably mounted inside the container, means connected to the coin receiving basket and controlled from outside the container for adjusting the position of the coin receiving basket in the container so that when a coin is inserted in the container the basket can be moved to catch the coin as it falls through the container, said container filled with liquid, the viscosity of the liquid selected to slow the movement of the coin falling through the container by a predetermined amount, said container including aiming means mounted at the upper



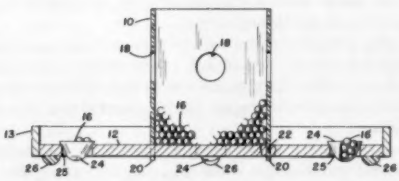
end of the container to control the dispersion of coins dropped through the coin receiving opening.

4,177,987

MARBLE GAME WITH SCOOP AND CUPS

Warren B. Zimmerman, 5 Vernon Hill Ct., Baltimore, Md. 21228

Filed Apr. 10, 1978, Ser. No. 894,765
Int. Cl.[2] A63F *7/00*
U.S. Cl. 273—1 R **6 Claims**



1. In a game of entertainment and skill for competition, coordination, and dexterity, having a game apparatus, removably associated game objects, and player units, which comprise:

a game apparatus structure;

a plurality of game scoring objects placed within said game apparatus structure;

a plurality of player manipulation devices to extract said game scoring object from said game apparatus structure,

a platform having a peripheral barrier encircling said platform and attached thereto by suitable means;

an open-ended container of more than two sides for said game scoring objects, centrally located on and removably attached to said platform on one of open ends of said container, and having an access aperture centrally located in each side thereof;

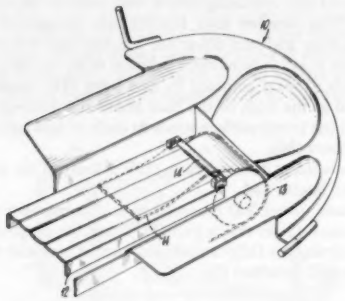
a plurality of cup-like containers removably located and set in apertures in said platform, one each in said platform opposite each side of said open ended container, for holding extracted game scoring objects from said open-ended container; and

a plurality of rubber-like legs on the bottom surface of said platform and attached thereto by suitable means, said rubber-like legs providing clearance for said cup-like containers extending through platform, and further preventing movement of said game apparatus structure during play of game.

4,177,988
PIN ORIENTATOR

Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223

Continuation-in-part of Ser. No. 781,571, Mar. 28, 1977, abandoned. This application Dec. 14, 1977, Ser. No. 860,578
Int. Cl.[2] A63D *5/09*
U.S. Cl. 273—43 D 9 Claims

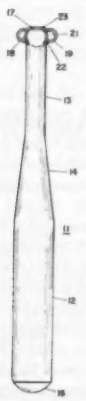


1. In an automatic pinspotter bowling machine having an orientating pan from which the pins slide onto a distributor belt having the top run thereof supported throughout a major portion of its length by a belt runner, the improvement comprising an orientator having means adapted to contact and raise the bottom of the top run of the distributor belt above the plane of the belt runner to maintain the distributor belt closer than otherwise to the orientating pan.

4,177,989
HOLLOW BAT AND METHOD OF MAKING

James L. Easton, Los Angeles, and Gary W. Filice, Thousand Oaks, both of Calif., assignors to James D. Easton, Inc., Van Nuys, Calif.

Filed Nov. 28, 1977, Ser. No. 855,320
Int. Cl.[2] A63B *59/06*
U.S. Cl. 273—72 A 2 Claims

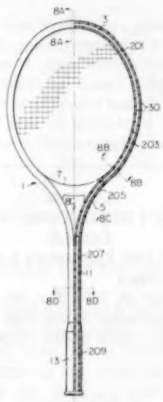


1. A ball bat comprising:
a bat body having a generally cylindrical hollow handle portion open at one end and having an enlarged section therein adjacent the open end, the enlarged section having a circumference which, progressing along the axis of the cylindrical handle portion, first enlarges from the circumference of the remainder of the handle portion and then reduces to a circumference generally equivalent to the circumference of the remainder of the handle portion;
a hollow end knob having an interior cavity of transverse cross-section substantially larger than that of the handle portion of the bat body, the cavity having at one end an opening adapted to fit closely over the handle portion and being closed at the other end by a transverse wall;
the end knob being positioned over the enlarged section of the handle portion of the bat body with the end of the body abutting the transverse wall of the knob and the cavity opening encompassing the handle portion adjacent the enlarged section and pressing tightly thereagainst to provide a mechanical joint which resists both longitudinal and circumferential movement of the knob relative to the bat body.

4,177,990
RACKET FRAME

Takao Kajiwara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 28, 1977, Ser. No. 837,541
Claims priority, application Japan, Oct. 4, 1976, 51/119226
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 C 14 Claims



1. An improved racket frame comprising
a discontinuous core extending continuously around said racket frame and made up of a plurality of foamed resin core pieces longitudinally aligned in end-to-end abutting relationship, and
a fiber reinforced plastic envelope, with numerous fibers embedded therein, wholly covering said discontinuous core.

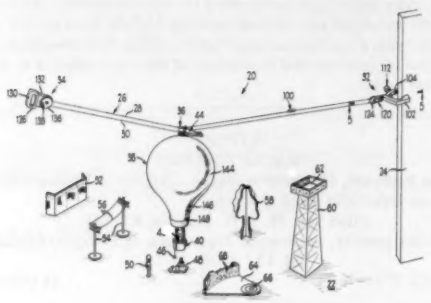
4,177,991
AMUSEMENT APPARATUS

Burton C. Meyer, Downers Grove, and Palmer J. Schoenfield, Lake Forest, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 31, 1978, Ser. No. 873,790
Int. Cl.[2] A63H *27/10*
U.S. Cl. 273—95 B 14 Claims

1. An amusement apparatus comprising:
an endless loop of elongated flexible cord including an upper run and a lower run;
pulley means adjacent one end of said loop adapted to be detachably connected to an object for permitting movement of the cord of said runs toward and away from said object;
hand held movable control pulley means adjacent an opposite end of said loop including rotatable means for moving the cord of said runs toward and away from said object;
trolley means supported from said endless loop connected

for movement along with the cord of one of said runs to move between said object and said control pulley means;
an aerial toy releasably supported from said trolley means and stop means on one of said runs engageable to release said toy from said trolley; and
support means carried by said trolley means including a



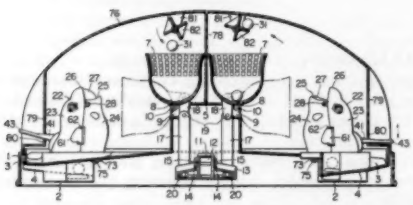
support for holding a portion of said aerial toy in position ready for release, resilient biasing means for propelling said aerial toy outwardly away from said support when released and trigger means for retaining said aerial toy in said ready position and operable to release said aerial toy to be propelled outwardly by said biasing means when said trigger means engages said stop means.

4,177,992

BALL FLING-OUT STRUCTURE WITH PIVOTING GOALS

Masatoshi Todokoro, 2-33, Koganehara 2-chome, Matsudo-City, Chiba-Prefecture, Japan

Filed May 15, 1978, Ser. No. 905,657
Claims priority, application Japan, Feb. 4, 1978, 53-13235[U]
Int. Cl.[2] A63B *63/04;* A63F *7/00*
U.S. Cl. 273—101 **2 Claims**



1. A game board arrangement wherein balls disposed towards the outer periphery of a game board are flung out of an animated head into a basket centrally located on the game board, comprising in combination:

(a) a base board (1) with a board center and board ends, recessions (2) extending from said board ends towards said board center and channels (3) for rolling balls into a part of said recession positioned closer to said board center;

(b) a plurality of basket-like ball-receiving goal structures (7) pivotally mounted in the center of the base board (1) so that said structures can freely turn from a horizontal to a vertical and from a vertical to a horizontal position;

(c) a lever (11) connected to said goal structures so that said structures may be turned from the vertical to the horizontal position by the operation of said lever;

(d) ball fling-out structures (22) disposed towards the periphery of the base board, each of said ball fling-out structures (22) being shaped like an animal or fish with a ball fling-out mouth-like opening (25) having a cover (27) at the top of each of said ball fling-out structures such that the fling-out opening (25) is opened and closed by said cover (27), a ball fling-out member positioned in each of said recessions (2);

(e) a track (29) provided in each of said ball fling-out structures for guiding the flung-out ball so that a ball (31) will be flung out from said opening (25) towards the goal structure;

(f) a lever (41) extending below said track for actuating said ball-fling member (34), control bars connected between said lever and said cover for moving said cover from its closed position to its open position when the ball fling-out member (34) is actuated by said lever (41), channels provided at the ends of the base board for guiding the balls from the board surface towards each of said ball fling-out members (34);

(f) a transparent dome covering the entirety of the upper side of the board; and,

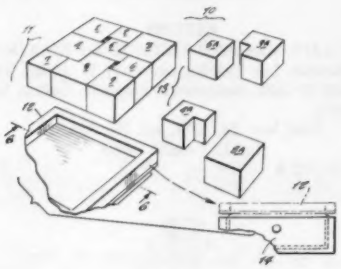
(g) a vane wheel (82) mounted to said dome over said goal structure (7) so that a ball (31) flung out from said fling-out structures (22) can hit said vane wheel and drop into said goal structure (7).

4,177,993

VARIABLE BLOCK PUZZLE AND CONTAINER

Bruce R. Crosby, 8650 Pitner #180, Houston, Tex. 77080, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 29, 1977, Ser. No. 828,869
Int. Cl.[2] A63F *9/10*
U.S. Cl. 273—160 **2 Claims**



1. A puzzle comprising a plurality of blocks with interfitting and abutting surfaces which when properly assembled form a rectangularly shaped assembly of predetermined dimension in combination with a container having a cavity of rectangular contour adapted to snugly receive the assembly thereon in further combination with means for varying the shapes of some of said blocks forming sub assemblies adapted to replace specific sub assemblies of said blocks to obtain the same said assembly of predetermined dimensions, wherein said container includes a compartment underlying said cavity for storing all of said blocks thereon, wherein, said means comprises additional blocks which replace certain blocks of different shape of the assembly, said additional blocks forming subassemblies similar to the replaced subassemblies.

4,177,994

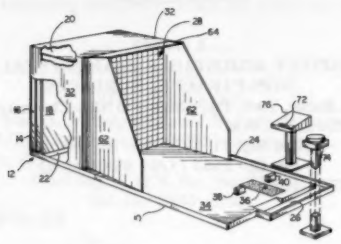
GOLF GAME AND PRACTICE APPARATUS

Everet F. Lindquist, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 20, 1976, Ser. No. 752,022
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 FA **10 Claims**

1. An apparatus for predicating the flight and measuring the direction of a golf ball or the like hit by a player from an initial position in a player station by measuring the critical dimensions

of the initial segment of the trajectory, said apparatus comprising a penetrable grid through which said ball travels, said grid having a first group of a plurality of spaced-apart electrical conducting wires positioned in the same first plane, a first supporting structure to which said wires are affixed, a second group of a plurality of spaced-apart electrical conducting wires positioned on said grid in the same second plane, a second supporting structure to which said wires are affixed, said first and second supporting structures being relatively positioned so that one of said planes is located closer to the player station than the other of said planes with the wires in said first plane extending transversely to the wires in said second plane, said first and second planes being spaced-apart so that the wires in



one plane do not normally contact the wires in the other plane, means for securing the wires in each of said planes to their respective supporting structures so as to provide for limited movement of the wires without permanent deformation thereof within the range of limited movement, said limited movement being sufficient to permit the wires in each plane to separate and allow a ball to pass through the grid, the spacing of said first and second planes being within the range of said limited movement of said wires to provide for contact of a wire in the plane closer to the player station with a wire in the other plane when struck by a ball, and electrical detecting means to detect the point of contact of the first pair of wires one in each of said planes when a ball hit from said player station passes through said grid.

4,177,995

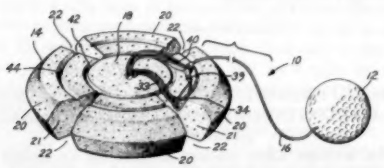
GOLF PRACTICE DEVICE

Charles C. Surland, 12538 Parkvilla Ave., Baton Rouge, La. 70816

Continuation-in-part of Ser. No. 822,382, Aug. 5, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,043

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—199 A **7 Claims**



1. A golf practice device, comprising, in combination:

(a) a golf ball;

(b) a substantially planar drag member, said planar drag member being formed of a flexible material providing a self-sustaining form and having a central portion and a plurality of radial segments extending outward from said central portion, said segments defining means for accommodating and channeling an air-flow transverse to said planar drag member and for causing said planar drag member to deform in a substantially conical shape in response to an air flow transverse to said planar drag member;

(c) means for attaching said planar drag member to said golf ball, said attaching means comprising a flexible elongated member attached centrally to a first, planar surface of said planar drag member and extending from said planar surface in a direction transverse to said planar member, said planar member being pulled behind said golf ball by said attaching means to define means for presenting immediately upon movement of said ball a surface area which resists air movement substantially transverse to the flight trajectory of said golf ball; and

(d) said planar member, said attaching means and said golf ball cooperating to define means for varying said surface area inversely with the speed of movement of said golf practice device through the air.

4,177,996

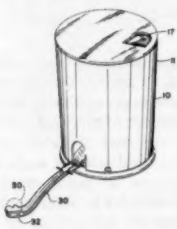
AUTOMATIC GOLF BALL TEEING APPARATUS

Tommy J. C. Chang, No. 12, Lane 181 Pin Chiang St., Taipei, Taiwan

Filed May 15, 1978, Ser. No. 905,873

Int. Cl.[2] A63B *57/00*

U.S. Cl. 273—201 **3 Claims**



1. A device for storage and individual dispensing of golf balls, comprising:

A housing, said housing having a vertical spiral track positioned therein, said track having ball entrance and exit ends; an inclined fixed chute, said fixed chute being attached to said housing and positioned at said exit end of said spiral track for receiving golf balls therefrom; an inclined pivot chute, said pivot chute being attached to said housing by pivot means so as to swing in a substantially horizontal plane and for receiving balls from said fixed chute; escapement means attached to said fixed chute to block the path of a golf ball otherwise freely rolling on said fixed chute, said escapement means being linked to said pivot chute to permit one golf ball on said fixed chute to freely roll off said fixed chute and onto said pivot chute and to permit another ball from said spiral track to roll onto said fixed chute, said one ball and said another ball being respectively simultaneously released from and retained onto said fixed chute in response to said pivot chute being swung about said pivot means; said pivot chute having means at its lower end for retaining a golf ball in position to be hit by a player.

4,177,997

FLOATING SEAL

John N. Cartwright, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

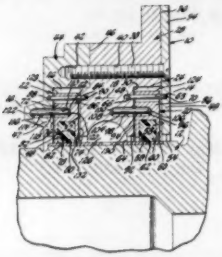
Filed Dec. 8, 1978, Ser. No. 967,783

Int. Cl.[2] F16J *15/54, 15/40*

U.S. Cl. 277—27 **4 Claims**

1. A floating ring seal assembly for accommodating eccentric shaft motions in a high speed rotary device comprising a seal housing having spaced internal side walls defining an annular opening, an axial bore extending through said housing for receiving an axial extension of a drive shaft for a rotary machine and including a seal surface thereon, a seal carriage located in said annular opening, a wear seal element supported

by said seal carriage and having a radially inwardly located surface thereon in engagement with the seal surface of said shaft, means to support said carriage against rotation with respect to said seal housing and including means to permit floating radial movement of said carriage within said opening, spacer means to accommodate axial thrust on said seal carriage produced by the fluid pressure force thereon, said means being configured to maintain a minimal gap between said seal carriage and one of said internal walls of said seal housing to control leakage of pressure around said seal element to a low



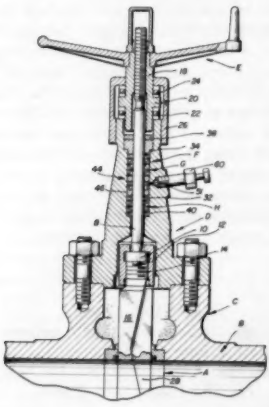
pressure return region whereby the minimum gap is maintained during periods of operation with substantial high pressure produced side thrust on said seal carriage thereby permitting free radial adjustment of said seal carriage during rotation of the shaft within the bore without contact between said carriage and the one of said internal walls to prevent frictional forces causing resistance to radial motion of said carriage within said openings thereby to assure reduced loading of the seal wear face against the seal surface of the shaft during all phases of operation thereof.

4,177,998

PACKING GLAND ASSEMBLY

Anthony A. Laitkep, Wharton; Danny S. Meyer, Richmond, and Willard J. Sitton, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 25, 1978, Ser. No. 937,683
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—59 **2 Claims**



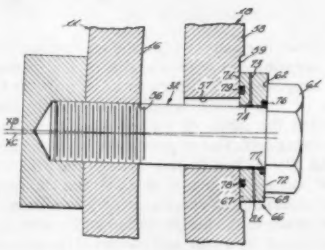
1. A packing assembly for a valve stem or shaft extending through a packing chamber having packing stops at the ends thereof, comprising outer and inner telescoping expander ring members received about the shaft or stem and fitting slidably in an intermediate part of the chamber, a plurality of V-type seal rings on opposite sides of said expander rings, an internal annular shoulder in said outer member, abutting the adjacent end of said inner ring in the collapsed positions of said expander rings, a collar at the opposite end of said inner member overlying the adjacent end of said outer member and spaced therefrom in said collapsed positions, a plurality of radial holes in said inner member adjacent said shoulder, an annular recess in the inner wall of said inner member intersecting said radial holes, and a fitting for plastic sealing material communicating with said radial holes and said recess for injection of sealing material between said expander rings to thereby separate the same and radially expand said seal rings and also to inject said seal material through said holes and recess inside and about said expander rings as secondary seal means.

4,177,999

INFINITELY ADJUSTABLE BEARING SEAL FOR NON-PARALLEL SURFACES

Harry M. Raber, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 11, 1978, Ser. No. 941,085
Int. Cl.[2] F16J *15/06;* **F16B** *43/02*
U.S. Cl. 277—112 **5 Claims**



1. Apparatus for sealing the opening in a first member which is to be secured to a second member by a fastener having a bearing surface which is not parallel to the bearing surface of the first member with which it must engage;

an infinitely adjustable wedge seal means surrounding the fastener and interposed between the bearing surface of the fastener and the bearing surface of the first member;

whereby the infinitely adjustable wedge seal means can be adjusted to provide full bearing with which the bearing surface of the fastener can fully engage with and thereby seal the opening between said adjustable wedge seal means and the fastener.

4,178,000

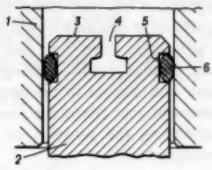
SEALING PROVIDED BETWEEN THE WALLS OF A COOLED CONTINUOUS MOULD AND THE HEAD OF A STARTER BAR

Gottfried Kuttner, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 6, 1978, Ser. No. 884,001
Claims priority, application Austria, Mar. 25, 1977, 2099/77
Int. Cl.[2] B22D *11/08;* **F16J** *15/18*
U.S. Cl. 277—138 **31 Claims**

1. A sealing arrangement to be used in a continuous casting plant of the type including a cooled continuous mould, said cooled continuous mould having walls and accommodating a starter bar having a starter bar head, said sealing arrangement being provided between said walls of said cooled continuous mould and said starter bar head, wherein the improvement is characterized in that said sealing arrangement comprises an elastic seal, said starter bar head having an annular peripheral

recess, said elastic seal being inserted in said annular peripheral recess and being dimensioned so as to close off said recess, said



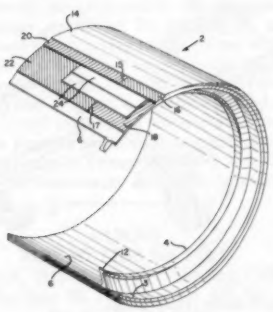
seal also extending completely about the starter bar head periphery.

4,178,001

PIPE COUPLING

John M. Stanley, Milledgeville, and Bernard A. Greene, Gray, both of Ga., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 5, 1978, Ser. No. 939,187
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—152 **2 Claims**



1. A cylindrical pipe coupling including, an inner layer of rubber like material, a second layer of two sections of rubber like material reinforced with cord material, each section laid at an angle of about 65° with respect to the longitudinal axis of the coupling, one section having a left helix and the other a right helix, third and fourth layers of rubber like material positioned over the intersection of the two sections of said second layer, a fifth layer of two sections of rubber like material reinforced with cord material, each section laid at an angle of about 65° with respect to the longitudinal axis of the coupling, one section having a left helix and one a right helix, the helix of each section being opposite to the section of the second layer located under it,

and a sixth layer of rubber like material located as an outer surface of said coupling, said coupling adapted to permit the insertion of a first pipe into one end thereof, said coupling further including a first annular insert located near the opposite end of the coupling, said first insert being comprised of a ridge shaped lip of rubber-like material affixed to or integral with the inner surface of said inner layer, said first insert defining an opening of a smaller diameter than said inner layer and being adapted to permit the insertion of a portion of a second pipe into said coupling,

and a second annular insert located inwardly from said end of the coupling, said second insert comprising an inwardly protruding gasket shaped rubber like material affixed or integral with the inner surface of said inner layer, said second insert defining an angle of approximately 45° with said inner surface and defining an opening of a diameter less than the opening defined by said first insert,

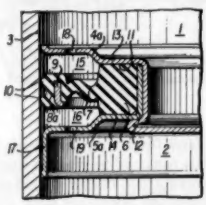
said first and said second inserts being adapted to permit the insertion of a portion of a second pipe into said coupling, thereby effectively sealing said first pipe with said second pipe.

4,178,002

SEPARATING PISTON FOR HYDROPNEUMATIC ONE-TUBE VIBRATION DAMPER

Ernst Kayser, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Mar. 2, 1976, Ser. No. 663,166
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514056
Int. Cl.[2] F16J *15/20*; B61F *15/22*
U.S. Cl. 277—212 **11 Claims**



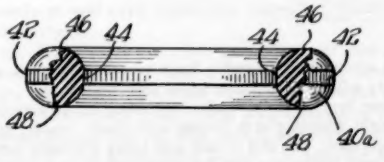
1. In a hydropneumatic one-tube vibration damper comprising a cylinder, a piston displaceably disposed within said cylinder, an annular elastomeric sealing element disposed about said piston and freely movable therewith and subdividing said cylinder into two separated fluid-tight chambers so that there will be no leakage between a hydraulic fluid in one of said chambers and pneumatic fluid in the other of said chambers, the improvement wherein said sealing element comprises an inner portion clamped by said piston, an outer portion in sliding contact with said cylinder and an intermediate flexible web portion connecting the inner and outer portions and flexing in response to small displacements of the piston to effect a small displacement of the piston without sliding displacement of said outer sealing element portion relative to said cylinder and wherein the outer portion of said sealing element is approximately semicircular in cross-section where it abuts the cylinder wall.

4,178,003

O-RING AND APPARATUS AND METHOD OF MANUFACTURE

Carroll D. Hobson, Goshen, Ind., assignor to Goshen Rubber Co., Inc., Goshen, Ind.

Filed Mar. 11, 1977, Ser. No. 776,730
Int. Cl.[2] F16J *15/54*
U.S. Cl. 277—237 R **6 Claims**



1. An O-ring comprising a molded resilient body annularly disposed about an axis, said body prior to use being generally round in radial cross-section and being provided with a molded

annular flattened area axially extending along one peripheral surface.

4,178,004

SPARE FUEL TANK FOR VEHICLE USE

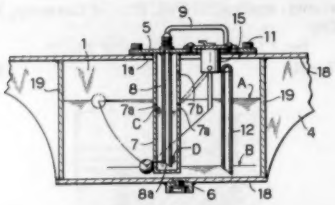
Akibumi Shinoda, Handa, and Masahiko Shimizu, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 18, 1977, Ser. No. 853,231

Claims priority, application Japan, Nov. 20, 1976, 51-155942[U]; Oct. 12, 1977, 52-136655[U]

Int. Cl.[2] B60K *15/06*

U.S. Cl. 280—5 A **7 Claims**



1. A spare fuel tank for a main fuel tank having a fuel inlet and provided with a top wall having an opening therein and a cover plate for covering said opening, said spare tank comprising a vertically elongated container with a bottom, extending vertically inside said main fuel tank and being fixed to said cover plate, said spare fuel tank being of size passable through said opening as a prefabricated entirety;

at least one spare tank fuel inlet opening for natural flow-in of fuel at the time of fuel supplying to said main fuel tank formed at a position slightly lower than the normal full level of the fuel in said main fuel tank;

a spare-fuel suction pipe inserted into said spare tank such that the lower end thereof almost reaches the bottom of said spare fuel tank; and

fastening means for securely and detachably attaching said spare fuel tank and said spare-fuel suction pipe oil-tightly to said main fuel tank via said cover plate.

4,178,005

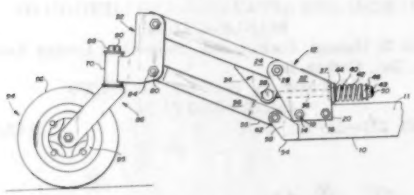
WHEEL MOUNTING ASSEMBLY

Frank N. Kent, Jr., Fayetteville, W. Va., assignor to Austin Industries, Inc., Dallas, Tex.

Filed Mar. 9, 1978, Ser. No. 884,822

Int. Cl.[2] B62D *61/12*

U.S. Cl. 280—43.18 **6 Claims**



3. A casterwheel assembly for a towed implement which assembly will mount a casterwheel and comprises:

a caster bracket for pivotally supporting the casterwheel;

a height adjusting arm linking said caster bracket to said implement, one end of said arm being pivotally mounted to said implement and the other end of said arm being pivotally mounted to said caster bracket;

a control arm also linking said caster bracket to said implement, one end of said control arm being pivotally mounted to said caster bracket and the other end of said control arm being pivotally mounted to said implement, said control arm and said height adjusting arm being disposed in substantially parallel relation to form a pantographic linkage between said implement and said caster bracket; and

adjustment means affixed at one end to said height adjusting arm, and being adjustable relative to said implement, the adjustment of said means capable of changing the position of said implement with respect to the terrain by pivoting said height adjustment arm about the rear of said implement thereby changing the position of the implement relative to the casterwheel.

4,178,006

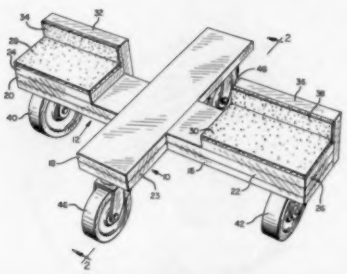
FURNITURE DOLLY

Richard E. Johnson, 3509 River Rd., Eugene, Oreg. 97404

Filed Feb. 21, 1978, Ser. No. 879,239

Int. Cl.[2] B62B *5/00*

U.S. Cl. 280—79.1 A **10 Claims**



1. A furniture dolly comprising:

a frame and four swivel casters secured in supporting relation to said frame adapting the same to traverse a substantially horizontal surface,

said four swivel casters including spaced first and second side casters located toward first and second lateral sides of said frame, a third caster rearward of a line between said first and second casters, and a fourth caster forward of a line between said first and second casters, wherein said third and fourth casters are mounted on said frame to contact said horizontal surface in the alternative adapting said frame to rock about said first and second casters to a position where either said third caster or said fourth caster supports said frame upon the horizontal surface,

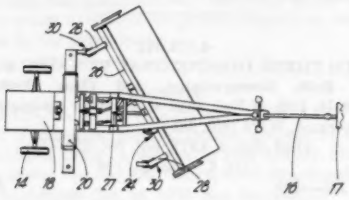
said frame having a laterally extending furniture receiving ledge comprising a substantially horizontal shelf above the level of said first and second casters and extending in a direction approximately parallel to said line between said first and second casters, said substantially horizontal shelf being forward of said third caster and rearward of said fourth caster and being narrow compared to the distance between said third and fourth casters, said shelf being provided proximate its forward edge toward said fourth caster with an upstanding backrest completing a furniture holding configuration with said shelf that is approximately L-shaped in cross section against which said furniture may be placed, adapting movement of said furniture to produce rotation of said ledge about an axis between said first and second casters to place either said third caster or fourth caster in a bracing position relative to furniture moved on said dolly.

4,178,007

HYDRAULIC ANTI-SHIMMY DEVICE FOR CASTER WHEELS

Jacques Martineau, Laval, Canada, assignor to Caelter Enterprises, Ltd., Montreal, Canada

Filed Mar. 20, 1978, Ser. No. 890,646
Claims priority, application Canada, Sep. 23, 1977, 287415
Int. Cl.[2] B60B *33/00*
U.S. Cl. 280—80 R 5 Claims



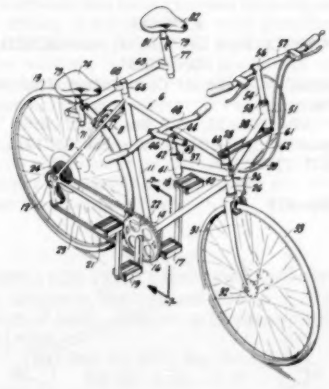
1. A caster wheel supporting arrangement comprising:
a chassis member carrying bearing means having a generally vertical axis,
a rotatable assembly including a caster wheel bracket held by said bearing means,
a rotary hydraulic pump carried by the chassis member and having a rotor connected for rotation by the rotatable assembly, said pump having two ports and being such that at any position of the rotor the pump can move hydraulic fluid from one port to the other or vice versa depending on the direction of rotation of the rotor, and
a hydraulic circuit connecting the ports of the pump and including a pressure sensitive flow resisting device of the type which opens to increase the flow area therethrough dependent on the pressure difference between said ports.

4,178,008

SIDE BY SIDE BICYCLE

Robert C. Barrett, 1511 Walnut St., Berkeley, Calif. 94709

Filed Sep. 21, 1977, Ser. No. 835,305
Int. Cl.[2] B62M *1/00*
U.S. Cl. 280—231 6 Claims



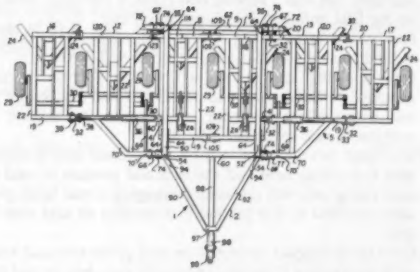
1. A side by side bicycle comprising:
a frame having a rear fork thereon and a rear wheel rotatably supported by said rear fork;
a front fork journalled on said frame on a generally upright axis and rotatably supporting a front wheel;
a yoke on said frame adjacent said front fork and having first and second yoke bars of predetermined length laterally extending from opposite sides thereof;
a first set of laterally extending handle bars rotatably mounted on the outer end of said first yoke bar and being drivingly connected to said front fork, each handle bar of said first set extending more than said predetermined length from said outer end of said first yoke bar;
a second set of laterally extending handle bars fixedly but adjustably mounted on the outer end of said second yoke bar, each handle bar of said second set extending more than said predetermined length from said outer end of said second yoke bar;
a pair of laterally spaced seats adjustably mounted on said frame on opposite sides thereof;
drive means for said rear wheel and including a pair of cranked pedals on each side of said frame; and
means for offsetting said first set and said second set of handle bars relative to each other in at least one of the vertical and fore and aft directions whereby said handle bars of said sets are in non-interfering paths and the arms of a pair of riders will overlap without interference and thereby permit positioning said riders in close proximity to said frame.

4,178,009

MULTI-SECTION IMPLEMENT AND DRAFTING STRUCTURE THEREFOR

Richard A. Worick, Beloit, Kans., assignor to Sunflower Manufacturing Company, Inc., Beloit, Kans.

Filed Mar. 29, 1978, Ser. No. 891,461
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—411 A 10 Claims



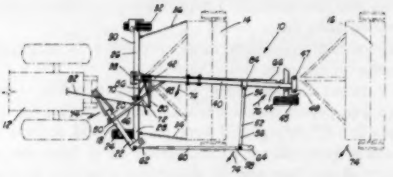
1. For use with a multi-section implement having a plurality of interconnected tool-carrying sections each having front and rear beams and arranged abreast to a line of draft and including at least one center section and adjoining wing sections connected by intersection hinges to said center section for flexing over ground contours and folding said wing sections relative to said center section and generally transverse to the line of draft, a drafting structure comprising:
(a) a rigid frame of spaced draft beams each having front and rear ends and at least one spreader beam extended transversely to said draft beams and connected thereto near said rear ends;
(b) said draft beams extending generally over said center section with said draft beams aligned generally longitudinally to the line of draft and having hinge means swingably mounting said frame to said wing sections for folding thereof at least near said rear ends of said draft beams and spanning said intersection hinges for resisting inward gathering forces causing arching of said center section with respect to said wing sections; and
(c) hitch means for connecting said draft beams to a drawing vehicle.

4,178,010

IMPLEMENT HITCH ASSEMBLY

Jerome J. Gerber, Murdock, Kans. 67111

Filed Jul. 13, 1978, Ser. No. 924,243
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—412 **9 Claims**



1. An implement hitch assembly attached to the rear of a self-propelled pulling vehicle, the assembly towing a front implement and a rear implement in a tandem position when traveling on a roadway, the assembly towing the front implement in a side-by-side position with the rear implement when in the field, the assembly comprising:

a hitch bar having a first end portion adapted for pivot attachment to the pulling vehicle and a second end portion mounted on a hitch wheel;

a draw bar laterally disposed to the direction of travel, said draw bar having a first end portion pivotally attached to the second end portion of said hitch bar and a second end portion mounted on a draw bar wheel, the front implement pivotally attached to said draw bar;

a side bar having a first end portion pivotally attached to said draw bar and a second end portion mounted on a side bar wheel, the rear implement pivotally attached to said side bar;

a pivot arm having a first end portion pivotally attached to said side bar and a second end portion pivotally attached to the first end portion of said hitch bar;

a first swing arm having a first end portion pivotally attached to said side bar and a second end portion;

a second swing arm having a first end portion pivotally attached to the second end portion of said first swing arm and a second end portion attached to the second end portion of said hitch bar;

a rear latch bracket mounted on the second end portion of said first swing arm and the first end portion of said second swing arm and releasably engaging a rear latch pivotally attached to the second end portion of said side bar; and

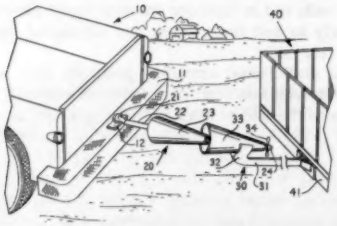
a front latch bracket mounted on said pivot arm and releasably engaging a front latch pivotally attached to said draw bar.

4,178,011

TAPERED FIT COUPLING METHOD AND APPARATUS

John G. Kirsch, 2600 Old Ranch Rd., Carson City, Nev. 89701

Filed Feb. 22, 1977, Ser. No. 770,566
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—477 **4 Claims**



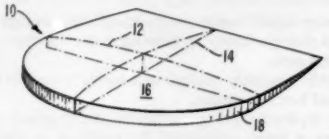
1. Apparatus for coupling a load to a power unit comprising: (1) A first tapered element containing a drift pin slot connected to the power unit; (2) A second tapered element containing a drift pin slot, partially alignable with the drift pin slot in the first tapered element so that a drift pin may be inserted through the two partially aligning drift pin slots for purpose of separating the two tapered elements when they are in contact with one another, connected to the load; (3) A misaligning pilot shaft between the two tapered elements; and (4) Means upon the misaligning shaft to draw the two tapered elements into intimate and rigid contact.

4,178,012

SKI WITH THREE-DIMENSIONAL RUNNING SURFACE

Walter, Roth, Sondermoning, and Hans Woitschätzke, Grünwald, both of Fed. Rep. of Germany assignors to Trak Incorporated, Ward Hill, Mass.

Filed Dec. 2, 1977, Ser. No. 856,777
Int. Cl.[2] A63C *5/04*
U.S. Cl. 280—609 **21 Claims**



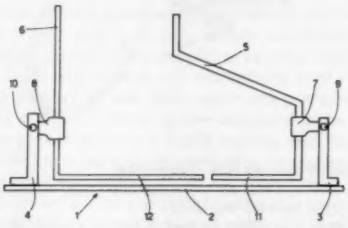
1. A gliding device particularly adapted for gliding over snow having a front end and a rear end and a three-dimensional bottom running surface, which surface comprises a plurality of protuberances which are inclined with respect to the bottom plane of the running surface and rise towards the rear end of the device to prevent backward movement of the device in use, said protuberances especially being scale-like and characterized in that the surface of said protuberances is convexly curved in both longitudinal and in transverse directions of the running surface to provide for improved forward gliding properties of the device and wherein the boundary line of said protuberances, which faces the front end of the device, lies substantially in the bottom plane of the running surface of the device.

4,178,013

FIXING DEVICE FOR SECURING NON-RIGID SHOES ON SKIS

Jean R. Bataille, 20, rue du Commandant René Mouchette, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,250
Claims priority, application France, Feb. 25, 1976, 76 05252; Feb. 14, 1977, 77 04133
Int. Cl.[2] A63C *9/086*
U.S. Cl. 280—618 **7 Claims**



1. A device for securing a skier's foot to a ski, said ski having a binding mounted thereto, the device comprising:

a base member detachably connectible to the ski binding;

framework means mounted to the base member, the frame-

work means being adapted to receive a skier's foot within the framework;

expandable chock means mounted to the interior of the framework to engage and clamp the skier's foot;

pump means carried by the framework and in communication with the chock means to supply the chock means with a fluid medium to expand the chock means;

said pump means being located within the framework to be operative by motions and forces of the skier's foot on the pump means; and

valve means interposed between the pump means and the chock means to control the pressure applied to the chock means by the pump means.

4,178,014

BINDING WITH VERTICAL PIVOT AXES

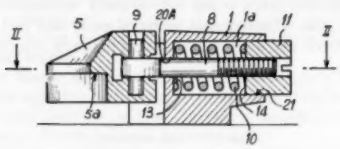
Georges P. J. Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 747,526, Dec. 6, 1976, abandoned. This application Oct. 18, 1978, Ser. No. 953,277

Claims priority, application France, Dec. 11, 1975, 75 37908

Int. Cl.[2] A63C *9/085*

U.S. Cl. 280—629 **7 Claims**



1. A safety binding for a ski having a longitudinal plane of symmetry and comprising a one-piece jaw having a rear end in which can be engaged and maintained one end of the sole of a ski boot, a casing integrally extending from said jaw frontwardly, support means connectible to said ski and providing two lateral support lines disposed respectively on either side of the longitudinal plane of symmetry of the ski, said jaw and casing defining a bore, said jaw having a transverse face, said support means comprising a support body engaged in said bore and having a transverse face opposed to the transverse face of the jaw, one of said transverse faces including projections and the other transverse face having recesses receiving said projections and defining said support lines while permitting relative movement between said jaw and said support body, and means in said bore resiliently acting on said jaw to urge said projections into said recesses such that the jaw can pivot on either line of support, the lines of support viewed along the longitudinal axis of the ski converging towards a point disposed above the ski in order that in one direction of lateral movement of the jaw, the jaw will pivot about one line of support and in the other direction of lateral movement of the jaw, the jaw will pivot about the other line of support.

4,178,015

INFLATED VEHICLE SPRING AND LIFT

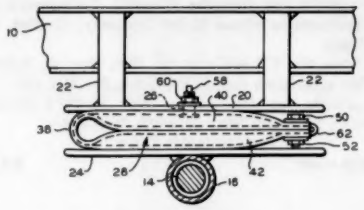
Henry H. Merriman, Jackson, and William J. White, Clark Lake, both of Mich., assignors to Merriman Products, Inc., Jackson, Mich.

Filed Dec. 12, 1977, Ser. No. 859,819

Int. Cl.[2] B60G *11/26*

U.S. Cl. 280—711 **6 Claims**

1. An inflatable air spring for vehicles having a frame mounted spring bracket and an axle mounted spring bracket comprising, in combination, a single collapsible elastomeric flexible wall tube radially expandable between inflatable and deflated conditions for location between the vehicle spring brackets and having first and second ends, said tube being folded over upon itself lengthwise defining upper and lower chamber portions and said ends being disposed adjacent each other in vertical juxtaposition, clamping means disposed above and below said tube ends closing said ends in air-tight relationship defining a pair of substantially horizontal linear seal joints, a conduit establishing communication between said tube upper



and lower chamber portions, said conduit extending into both of said seal joints, and an air valve communicating with one of said tube chamber portions.

4,178,016

TRIGGERING INSTALLATION FOR A PASSENGER PROTECTION DEVICE IN A VEHICLE

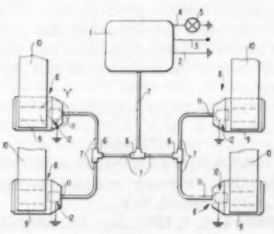
Rudolf Andres, Sindelfingen, and Heinz W. Knoll, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,723

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631190

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—734 **18 Claims**

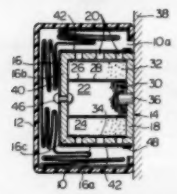


1. A triggering system for a motor vehicle passenger protection means activated by an energy source means, the triggering system comprising a sensor-controlled means including an igniter means, said sensor-controlled means supplying a triggering pulse to the igniter means in the presence of predetermined criteria, wherein the improvement comprises means for accommodating the igniter means so as to shield the igniter means from external influences, a transmission path means between the igniter means and the energy source means, the transmission path means including at least one high burning velocity fuse cord means arranged between the igniter means and the energy source means, and means for continuously testing the operating readiness of the transmission path means including an electrical line carried along with the fuse cord means.

4,178,017
SAFETY BAG INFLATION APPARATUS WITH EXTENDIBLE GUARD MEMBER AGAINST CONTACT OF BAG WITH HEATED GAS GENERATOR

Takashi Ishi, Sayama; Takuzi Murakami, Tokorozawa; Masayoshi Kato, Shiki, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 621,603, Oct. 10, 1975, Pat. No. 4,068,862.
This application Sep. 7, 1977, Ser. No. 831,239
Claims priority, application Japan, Nov. 20, 1974, 49-133866; Apr. 30, 1975, 50-59155; May 24, 1975, 50-69884
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—740 8 Claims



1. A safety apparatus comprising:

a gas generator including a housing with a plurality of gas outlets formed in a wall thereof, a combustible gas-generating composition disposed in said housing, and a heat-absorbing material disposed in said housing between said gas-generating composition and said outlets;

an inflatable bag folded and arranged such that said housing extends into said bag, the mouth of said bag in a fixed position with respect to said housing, so that said bag is inflated when a gas is discharged from said outlets; and

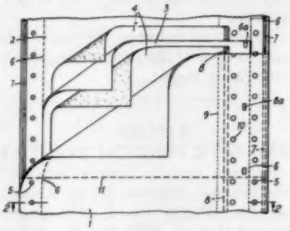
a guard member of a metal which has a first portion and a petal-like second portion bounded by an imaginary line drawn substantially parallel to the outer surface of said wall of said housing and is entirely interposed between said inflatable bag and said wall, said first portion being kept permanently in a fixed position relative to said wall of said housing, said second portion assuming an initial position so as to cover at least a part of said gas outlets until discharge of said gas from said gas outlets and being unfoldable along said imaginary line such that said second portion assumes another position more distant from said wall than said initial position when said gas is discharged from said gas outlets and remains at said another position after completion of the discharge of said gas from said gas generator.

4,178,018
CONTINUOUS STATIONERY ASSEMBLIES

Per W. Halse, Oslo, Norway, assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Oct. 4, 1977, Ser. No. 839,263
Claims priority, application United Kingdom, Oct. 5, 1976, 41237/76
Int. Cl.[2] B41L *1/20*
U.S. Cl. 282—11.5 A 5 Claims

1. A series-connected business form adapted to be fed through the printing means of a business machine, comprising, a pair of superimposed continuous outer webs having aligned opposed marginal edges, said webs having marginal feed strips including spaced feed holes extending along said marginal edges, said webs being directly connected together along longitudinal first connecting means lying adjacent said feed holes of said feed strips and extending along said marginal edges, a first continuous intermediate web disposed between said outer webs, said intermediate web having opposed side edges spaced inwardly of said marginal edges and of said feed holes, first lines of weakening provided in said outer webs adjacent one of said side edges, a second line of weakening provided in each of said webs inwardly of the other of said side edges, second connecting means lying between said second line of weakening and said other side edge for connecting said intermediate web to one of said outer webs, and said webs having spaced transverse lines of weakening in superimposed relationship for separating the form into individual units, whereby the form may be folded along said transverse lines

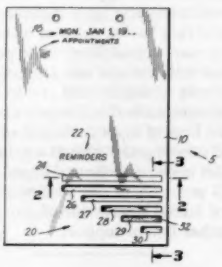


before being fed through the printing means with said webs in predetermined alignment with one another, and may be refolded along said transverse lines after leaving the printing means with said webs being substantially maintained in said alignment, and whereby said webs of each said unit may be separated from one another along said first and second lines of weakening.

4,178,019
DATE REMINDER CALENDAR

Milton Gedzelman, 80 Beekman St., New York, N.Y. 10038

Filed Apr. 28, 1978, Ser. No. 900,874
Int. Cl.[2] B42D *5/04*
U.S. Cl. 283—2 12 Claims



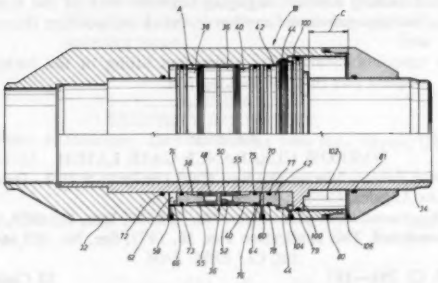
1. A date reminder calendar comprising a plurality of stacked sheets each representing a different date, said sheets being arranged in a plurality of like groups of sheets with each group representing a predetermined time period, at least one of the sheets of each group being provided with a marking area adapted to be marked in a manner readily distinguishable from similar areas which have not been marked, a number of sheets equal up to the number of sheets in a group being disposed above said marking area and being provided with openings generally aligned with each other and being successively larger the closer to said marking area, whereby each marking area becomes larger and more prominent with the removal of each successive sheet to thereby increasingly signify the imminency of the date and the reminder associated with said marked area.

4,178,020

LOCKING SLIP JOINT AND METHOD OF USE

Emil E. Dopyera, Houston, Tex., assignor to Big-Inch Marine Systems, Inc., Houston, Tex.

Filed Dec. 15, 1977, Ser. No. 860,706
Int. Cl.[2] F16L *55/00, 17/02*
U.S. Cl. 285—18 11 Claims



1. A locking slip joint for connecting first and second tubular members comprising:

an outer sleeve having one end for connecting to a first tubular member;

an inner sleeve having one end for connecting to a second tubular member and having its other end disposed within said outer sleeve, said outer and inner sleeves providing a common central passage therethrough;

said outer sleeve having a precisely formed annular surface on its inside diameter and said inner sleeve having a precisely formed annular surface on its outside diameter, said annular surfaces being opposed in a spaced-apart relationship to define an annulus and being formed from deformable metal adapted to receive a continuous annular tooth by embedment;

seal means disposed within said annulus and comprising:

a ring member encircling said inner sleeve and including inner and outer joined arms defining therebetween a tapered annular recess adapted to forcibly receive a mating member for deforming the inner arm inwardly into engagement with said inner sleeve and deforming the outer arm outwardly into engagement with the outer sleeve, the engaging surface of each arm including at least one continuous annular tooth for embedding into the respective sleeves to form metal-to-metal seals;

a mating member having a tapered portion for mating with said recess of said ring member; and

means for forcing said mating member into said recess to effect deformation of said ring member and embedment of the annular teeth into the sleeves.

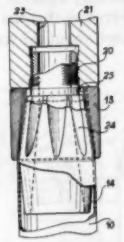
4,178,021

LEAK-TIGHT COUPLING DEVICE

Fernand Lauro, Grenoble, and Roland Podevin, Saint Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 21, 1978, Ser. No. 898,981
Claims priority, application France, May 5, 1977, 77 13699
Int. Cl.[2] F16L *33/22*
U.S. Cl. 285—255 7 Claims

1. A device for providing a leak-tight coupling between a flexible tube and a rigid coupling connector having two coaxial components adapted to fit one inside the other, the first component being mounted within and covered by the flexible tube and the second component being mounted externally around the flexible tube in such a manner that the end portion of said tube is clamped between said two components, wherein one of said first and second components of the coupling connector has a frusto-conical tube-engaging surface with concave, longitudinally extending grooves formed therein and the other component has a complimentary frusto-conical tube engaging surface with convex longitudinally extending ribs formed



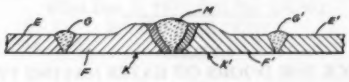
thereon, said ribs and grooves being adapted to cooperate with each other at the time of inter-engagement of said components so as to imprison said end portion of the tube.

4,178,022

WELDED AUSTENITIC STEEL PIPE ASSEMBLY

Rodney E. Hanneman, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1977, Ser. No. 816,338
Int. Cl.[2] B23K *28/02*
U.S. Cl. 285—286 3 Claims



1. A butt-welded austenitic stainless steel pipe assembly having special utility in a boiling water reactor by virtue of having substantially the stress corrosion cracking resistance of the components of the assembly prior to welding comprising a plurality of pipe lengths, spool pieces of substantially the same inside diameter as the pipe lengths joined coaxially to the ends of each pipe length by solution-annealed butt-welds and butt-welded to opposed spool pieces of adjacent pipe lengths, said spool pieces each having an end portion of substantially the same wall thickness as the pipe lengths and having another portion of substantially greater wall thickness terminating in a frustroconical surface at the open end of the spool piece to provide in cooperation with an abutting spool piece an annular recess substantially filled with weld metal, and said spool pieces each having a weld heat affected zone extending from the frustroconical surface and terminating axially within the said greater wall thickness portion of the spool piece.

4,178,023

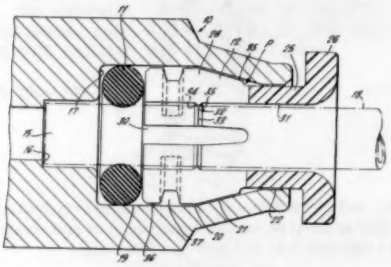
COUPLINGS FOR TUBES

John D. Guest, "Iona", Cannon Hill Way, Bray, Maidenhead, Berkshire, England

Filed Feb. 6, 1978, Ser. No. 875,713
Claims priority, application United Kingdom, Feb. 9, 1977, 5415/77; Jul. 26, 1977, 31398/77
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—323 15 Claims

1. A tube coupling for gripping a tube comprising a body member with a bore, said bore having an internal surface tapering to a narrower diameter in a direction towards an open end of the bore in said body member, a collet in said bore having a circumferentially continuous annular portion and resilient arms extending from said annular portion inwardly in the axial direction from the open end of the bore, said collet having external cam surfaces on said arms arranged to co-oper-

ate with said internal surface of said body member, said cam surfaces on the collet arms extending only part of the way along the length of the arms from the root end thereof where the arms join together such that the tapered internal surface on the body member engages only a part of the length of said arms adjacent the root end thereof so that the collet arms are forced radially inwardly by flexure about the root end when the collet



is moved axially towards the open end of the bore, the collet arms furthermore have an inwardly extending projection at a position along the length of each arm intermediate the ends thereof for engaging and gripping a tube in the collet, radially inwardly facing surfaces on the arms extending beyond the projection inwardly of the bore and being adapted to bear against the tube when the arms are forced inwardly to spread the gripping force along a large surface area of the tube.

4,178,024

ROD LOCK FOR DOORS OR GATES HAVING TWO WINGS

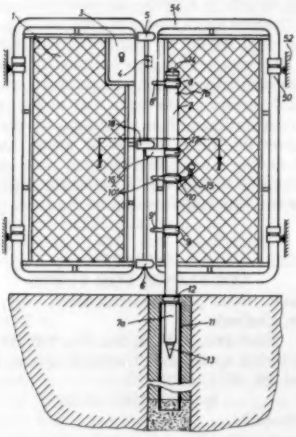
Remigius Wagner, Schulhausstrass 12, Wetzikon, Switzerland

Filed Jun. 26, 1978, Ser. No. 919,362

Claims priority, application Switzerland, May 7, 1977, 8299/77; Jul. 5, 1977, 8299/77

Int. Cl.[2] E05C *5/02*

U.S. Cl. 292—57 **10 Claims**



1. A rod locking arrangement for doors or gates having two wings, comprising:

a locking rod capable of being mounted at one wing for vertical displacement;

said locking rod being movable into a closed position where it engages with a floor recess;

at least one stop member provided at the other wing against which bears the wing having the locking rod;

a door lock effective between both of the wings;

at least two guide rings for guiding the locking rod for vertical movement and for rotational movement about its lengthwise axis;

a locking element mounted at the locking rod and pivotable together with said locking rod;

said locking element engaging between both of the wings bearing against one another in the closed position thereof; and

a retarding element for preventing lifting of the locking element and thus the locking rod.

4,178,025

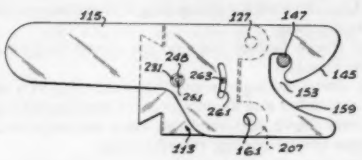
NARROW CLEARANCE GATE LATCH

Milton Robins, Marina Del Rey, Calif., assignor to PTI - Dolco, Los Angeles, Calif.

Continuation-in-part of Ser. No. 754,326, Dec. 27, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,464

Int. Cl.[2] E05C *3/04*

U.S. Cl. 292—117 **13 Claims**



1. A latching mechanism for selectively preventing relative movement between two otherwise relatively movable structures comprising

bar means suitable for fixed mounting on a first movable structure;

a plate means suitable for pivotal mounting on a second relatively movable structure and having

a first cam surface on a leading edge thereof,

a nose section adjacent one end of said first cam surface,

a bar-receiving notch opening adjacent said nose section and having

a second cam surface on a portion of the periphery of said notch relatively distal from said nose section,

a third cam surface on a portion of the periphery of said notch adjacent said nose section,

a bar holding surface on the periphery of said notch intermediate said second and third cam surfaces;

means for pivotally mounting said plate means to a relatively movable structure including

anchor plate means including

means for fixedly locating and mounting said anchor plate means on such a relatively movable structure and

means for attaching said plate means to said anchor plate means for relative pivotal movement therebetween, for retaining said plate means and said anchor plate means in a parallel relationship, and for holding said plate means and said anchor plate means in place relative to a relatively movable structure comprising

an aperture of predetermined first diameter in said anchor plate means,

an aperture of predetermined second diameter in said plate means, said first and second diameters being unequal,

bearing means having an outer diameter which is larger than the diameter of one of said apertures and smaller than the diameter of the other of said apertures and a greater axial length than the thickness of the one of said plate means and said anchor

plate means having the larger of said apertures, said bearing means being seatable within the larger of said apertures, and

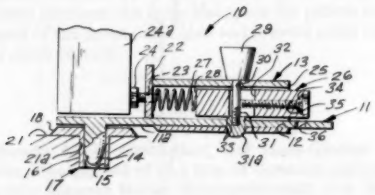
fastening means extending through said bearing means and the smaller one of said apertures and including means thereon, having a nominal diameter greater than that of the larger of said apertures, for preventing relative movement between the plates in a direction parallel to the axis of said fastening means.

4,178,026

SECURITY DOOR LOCK

William A. Sinkhorn, 2249 N. Medina Line Rd., Akron, Ohio 44313

Filed Mar. 1, 1978, Ser. No. 882,451
Int. Cl.[2] E05C *1/04*
U.S. Cl. 292—295 **9 Claims**



1. In combination with a door frame, a door mounted on said door frame and movable between an open and a closed position, a security door lock, said security door lock comprising: a lock housing, a slidable lock plate received in said lock housing, a pin presented from said lock plate, means in said door frame to receive said pin against lateral movement, said pin being insertable in said means only when the door is in the open position, a locking pin received in said lock housing and selectively engaging said lock plate for rendering said lock plate secure to said lock housing and thereby securing the door in its closed position against an intruder, a push-bar slidably received in said lock housing and manually movable between at least a first and a second position, said push bar engaging said locking pin and maintaining it in engagement with said lock plate when said push bar is disposed in said first position, said push bar disengaging from said locking pin to permit withdrawal of said locking pin from said lock plate when said push bar is disposed in said second position, spring means biasing said push bar toward said first position, and a knob external of said lock housing for lifting and lowering said locking pin.

4,178,027

DOOR LOCK GUARD

Marcel Charron, 44 Church St., East Hartford, Conn. 06108

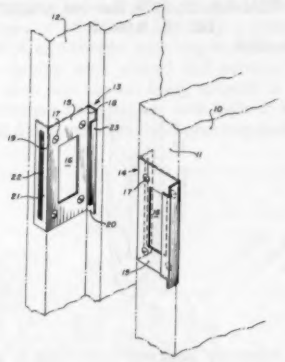
Filed Jul. 31, 1978, Ser. No. 929,444
Int. Cl.[2] E05B *17/00*
U.S. Cl. 292—346 **8 Claims**

1. A guard plate for use in a door lock guard, for use with locks of the type having a strike plate attached to a doorjamb and a latchbolt plate attached to a door, the guard plate comprising:

a support plate which is capable of being attached to a doorjamb or a door, the support plate including a cutout providing for protrusion of the strike plate or the latchbolt plate, said support plate defining two oppositely disposed edges;

a first flange extending from one edge of said support plate in a direction angled with respect to said plate said flange terminating in tongue which extends in generally parallel relation to the support plate; and

a second flange extending from said second edge of the support plate, said second flange including an aperture,



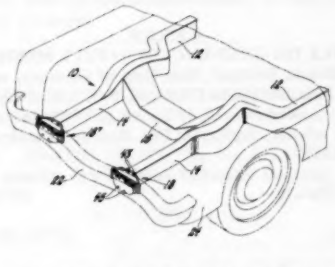
said flanges extending in opposite directions with respect to each other.

4,178,028

ENERGY ABSORBING MOUNTING FOR VEHICLE BUMPER

Loren E. Lura, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1977, Ser. No. 856,592
Int. Cl.[2] B60R *19/00*
U.S. Cl. 293—135 **3 Claims**



1. An energy absorber unit yieldably coupling relatively movable first and second components of a vehicle to one another comprising bracket means operatively connecting said components to one another, said bracket means having a pair of deflectable spring arms of resilient spring metal diverging in opposite directions from one another, an elongated energy absorber of resilient plastic material, first fastener means securing one end portion of said energy absorber to the extremity of one of said arms, second fastener means securing the other end portion of said energy absorber to the extremity of the other of said arms, connector means operatively connecting said bracket means to said relatively movable first and second components of the vehicle so that impact causing relative movement of said components from a pre-impact position toward each other causes said arms to resiliently deflect from one another and increase the spacing between said first and second fastener means to thereby stretch said energy absorber and so that said energy absorber dissipates the kinetic energy of said components as said components are relatively moved, said plastic energy absorber having a recovery rate lower than the recovery rate of said spring arms to permit said spring arms to return said components to said pre-impact position without added recovery force from said energy absorber.

4,178,029

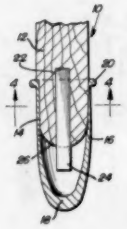
FERROUS OBJECT RETRIEVER

LeRoy A. LaPan, 1913 24th St., Bay City, Mich. 48706

Filed Feb. 22, 1978, Ser. No. 880,325

Int. Cl.[2] B66C *1/04*

U.S. Cl. 294—65.5 **2 Claims**



1. A tool especially designed to be used in a kitchen for retrieving ferrous objects, said tool comprising an elongated wooden handle including opposite ends, one of said ends including a diametrically reduced end portion having an endwise outwardly opening blind bore formed therein, an elongated permanent magnet having one end seated and secured in said bore with the other end of the magnet projecting endwise outwardly of said end portion, a hollow end cap removably engaged over said end portion and loosely enclosing the exposed end of said permanent magnet therein, the other end of said handle being of substantially the same cross-sectional shape and size as said end portion of said handle and said cap, when removed from said one end portion of said handle, may be removably snugly telescopingly engaged over the other end of said handle and comprise a handgrip for the last mentioned end of said handle.

4,178,030

GRAPPLE OR GRAB-BUCKET SAFETY MECHANISM

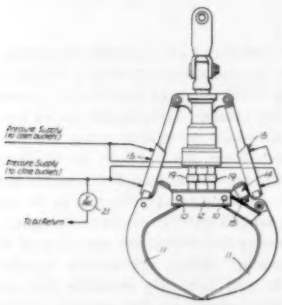
Hans Dolinsek, Stuttgart, Fed. Rep. of Germany, assignor to Firma Johannes Fuchs, Ditzingen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,324

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718434

Int. Cl.[2] B66C *3/16*

U.S. Cl. 294—70 **4 Claims**



4. In a grapple or the like excavating device for use as a working attachment for a crane, excavator or the like, said grapple comprising at least two pivoted buckets with at least one selectively operable double-acting hydraulic cylinder for bucket actuation from open to closed position and from closed to open position, the normal bucket-open position being limited by energy-absorbing buffer means, the improvement in which said buffer means includes a yieldably displaceable abutment having an energy-absorbing stroke of such extent that only a portion of said stroke is used in arresting bucket-opening movement in the presence of a bucket-opening actuation by said cylinder, whereby a portion of said stroke remains in which to absorb such mechanical shock in the bucket-opening direction as may be encountered by a bucket while in its normal bucket-open position, and pressure-relief valve means connected to that end of said cylinder which receives pressure fluid for actuation in the bucket-closing direction.

4,178,031

LIFTING GEAR FOR FILLED SACKS

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,155

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704732

Int. Cl.[2] B66C *1/58*

U.S. Cl. 294—82 R **3 Claims**

1. An annular supporting frame for lifting a filled sack, comprising a pair of clamping bars about which the gathered and flattened end of the sack is slung, characterised in that the supporting frame comprises a triangular lug (**3, 5, 6**) about the clamping bar (**3**) of which that is opposite the supporting angle (**7**) for suspending from the hook (**8**) of a crane there is placed that end (**1**) of the sack which is folded onto itself to form a loop (**4**) through which a second clamping bar (**9**) is pushed which has a flanged end piece (**10**) by which it is supported on a limb (**6**) of the lug connecting the clamping bar (**3**) to the supporting angle (**7**).

4,178,032

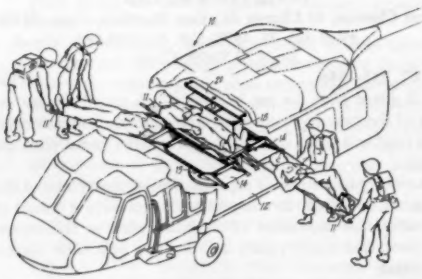
APPARATUS FOR SYNCHRONOUSLY ELEVATING AND LOWERING AIR-AMBULANCE LITTER WITH CRASH ATTENUATION CAPABILITY

Horace T. Hone, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1978, Ser. No. 901,881

Int. Cl.[2] B60P *3/26*; B64D *11/00*

U.S. Cl. 296—19 **9 Claims**



1. Litter elevating and lowering apparatus adapted for use in an air-ambulance comprising:

(A) a pulley-cable defining a continuous cable having two

selectively spaced vertical oriented portions and two crossed portions connecting the vertical portions so that motion of the cable over the pulleys will cause the vertical portions to move vertically upwardly and downwardly synchronously,

(B) litter support means connected to said cable vertical portions to provide level support for a patient bearing litter and for synchronous vertical litter motion with said cable vertical portions,

(C) means to cause said continuous cable to move over said pulleys to cause said litter support means to be either elevated or lowered synchronously,

(D) locking means to lock said cable against motion with said litter support means in a selected position of elevation and,

(E) crash attenuating means operatively associated with said continuous cable to permit said cable side portions and hence said litter support means to move gently a selected vertical distance in response to a preselected G-level load imposed thereon by a down-crash or other force to thereby attenuate the force and spare the patient the full impact of the down-crash load and prevent cable rupture as a result thereof.

4,178,033

MOTORCYCLE COVERING

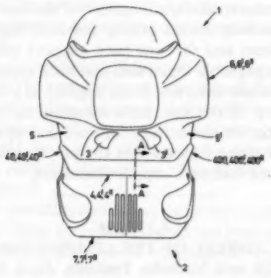
Hans-Albrecht Muth, Hechendorf, and Hans-Günther v. d. Marwitz, Münich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 799,951

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624850

Int. Cl.² B62J *17/04*

U.S. Cl. 296—78.1 **4 Claims**



1. A covering for a motorcycle which covers essentially the frontal area of the motorcycle from the handlebar down to the drive means as well as lateral areas of the motorcycle, and which consists essentially of an upper part and a lower part connected together in the area of a spoiler means formed integrally with the upper part and wherein the covering forms a fairing and the upper part, for purposes of forming the spoiler means, is constructed in its lower edge area projecting obliquely outwardly and downwardly from the motorcycle, characterized in that a connecting flange for the lower part is arranged at the spoiler means along the inner side thereof.

4,178,034

VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, P.O. Box 1138, Mount Dora, Fla. 32757

Filed Jan. 30, 1978, Ser. No. 873,211

Int. Cl.² B60K *11/02*

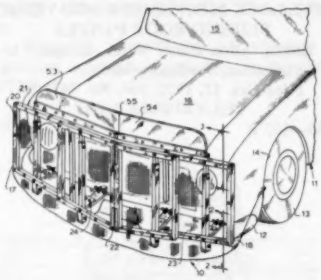
U.S. Cl. 296—91 **3 Claims**

1. An insect protection apparatus for moving vehicles comprising in combination:

frame means having a plurality of elongated rigid frame members;

a screen attached to said rigid frame members;

bumper attaching means for attaching said frame members to a bumper of a vehicle for holding a screen in front of said vehicle, said bumper attaching means having a pair of brackets having hook shaped end portions on one end thereof, each said bracket being adapted to hook onto a vehicle bumper and attached with bolts to a plurality of said rigid frame members for supporting said frame members in an upright position on a vehicle bumper, and a plurality of bumper engaging brace members for engaging a bumper to prevent said elongated rigid frame members from shifting on said bumper; and



said bumper engaging brace members being covered with a resilient material adapted to frictionally engage said bumper when said rigid frame members are attached to said bumper, said bumper engaging brace members each being attached between two elongated rigid frame members, thereby bracing said frame members to each other and against a bumper.

4,178,035

SUN VISOR FOR MOTOR VEHICLES

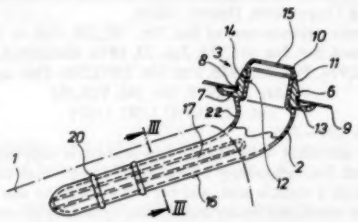
Kurt Cziptschirsch, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,317

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653988

Int. Cl.² B60J *3/00*

U.S. Cl. 296—97 K **18 Claims**



1. A sun visor for use in a motor vehicle, or the like, comprising:

a visor body shaped to serve as a visor;

a bearing housing adapted for mounting to the body of the vehicle, or the like; said bearing housing comprising a rotationally symmetric plug body having a plug opening extending into it; and

a bearing axle comprising: a first leg having bearing means thereon for enabling connection of said axle with said visor body and for enabling pivoting of said visor body around said axle first leg; said bearing axle also being pluggable into said bearing housing plug opening;

said plug body being generally in the form of a rosette in-

cluding a forwardly extending plug pin and a flange at the rear of said plug pin; said plug pin tapering conically narrower to the end thereof away from said flange;

a transition between said plug pin and said flange, said transition being annular and narrowed in diameter as compared with said plug pin at said transition, thereby to define a groove type undercut at said transition,

said plug body plug opening extending through said flange and said transition into said plug pin.

4,178,036

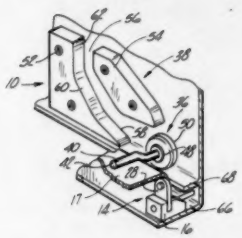
POSITIVE LOCK MECHANISM FOR VEHICULAR SLIDING ROOF PANELS

Milton C. Kalitz, Allen Park, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Oct. 17, 1977, Ser. No. 842,556

Int. Cl.[2] B60J 7/18

U.S. Cl. 296—137 B **19 Claims**



1. A locking action device for preventing movement of an automotive sliding roof panel, comprising:

(a) means for following the path of travel of the panel and connected thereto,

(b) a guiding surface interposed the path of travel of the following means, the following means engaging the guiding surface, the guiding surface defining the path of travel of the following means upon engagement therewith, and

wherein the following means is retained in position by the guiding surface to prevent dislodgment of the roof panel when the panel is positioned to close an opening in the roof.

4,178,037

SEAT RECLINER ASSEMBLY

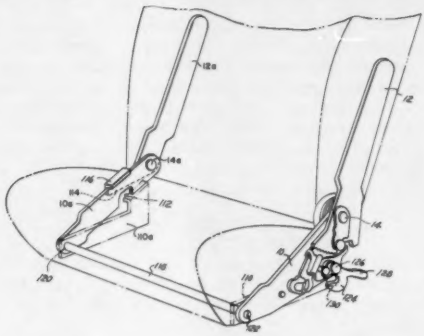
Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 730,228, Oct. 6, 1976, abandoned, Ser. No. 651,716, Jan. 23, 1976, abandoned, and Ser. No. 552,974, Feb. 26, 1975, Pat. No. 3,973,288. This application May 30, 1978, Ser. No. 910,296

Int. Cl.[2] A47C 1/00, 1/026

U.S. Cl. 297—326 **3 Claims**

1. A reclining vehicle seat and seat back supporting construction for supporting a seat back for pivotal movement relative to a vehicle seat, and for supporting the seat and seat back for simultaneous forwardly and upwardly pivotal movement to provide access to a space in rear of the seat, said construction comprising a pair of generally similar assemblies spaced apart laterally of the vehicle, each assembly consisting essentially of three flat elongated members shaped to provide for fabrication from flat stock by cutting and bending, said members for each assembly comprising an elongated flat base support member extending longitudinally of the vehicle and having its width dimension occupying a vertical plane, an elongated flat seat support member pivoted at its forward end to the forward end of said base support member, said seat support member having its width dimension occupying a vertical plane and having a flat side of its forward end in mutually supporting side-by-side sliding contact with a flat side of the forward end of said base support member, and an elongated flat seat back support member pivoted at one end to the rear end of said seat support member and movable relative thereto between a generally upright position and a rearwardly inclined reclining position, said seat back support member having its width dimension occupying a vertical plane and having a flat side of its said one end in mutually supporting side-by-side sliding contact with a flat side of the rear end of said seat support member, latch means for latching said seat back support member to said seat support member in a selectd one of a plurality of positions between upright and reclining position, said seat support members being separate, independent, and spaced apart, a torque-transmitting member extending transversely between said assemblies and rigidly connected at its ends to the forward ends of said seat support members, said



torque-transmitting member being pivotally connected adjacent its ends to both of said base support members and constituting the sole connection between said assemblies to ensure simultaneous equal tilting of both of said seat support members as the entire seat construction is tilted forwardly and upwardly to provide access to the space in rear of the seat construction, and rigid abutment means acting between one of said seat support members and the seat back support member pivoted thereto and engageable when said seat back support member is in upright position whereby force applied in a forward direction to the top of the seat back mounted on said seat back support member causes unitary forward and upward tilting of the entire seat construction about the pivot connections at the forward ends of said base support members.

4,178,038

HEADREST OF TREATMENT TABLE

Akio Yada, Uji, and Naonobu Tsukada, Joyo, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Mar. 14, 1978, Ser. No. 886,408

Claims priority, application Japan, Mar. 15, 1977, 52/31702[U]

Int. Cl.[2] A47C 1/10

U.S. Cl. 297—391 **4 Claims**

1. A headrest for a medical treatment table comprising:

a rigid headrest base, said base comprising:

a flat bottom plate;

at least two side pieces extending upwardly in an inverted-bell shape from both sides of said flat plate;

an end area of said flat bottom plate gently curved rearwardly; and

an end area of said side pieces gently curved rearwardly adjacent said end area of said flat bottom plate;

a cushion member coupled to said rigid headrest base; and

an extensible surface cover separate from said cushion member and detachably coupled to said rigid headrest base by U-shaped base attachment members integrally formed in said surface cover for covering said cushion member whereby said surface cover may be easily replaced when it becomes soiled.

4,178,039

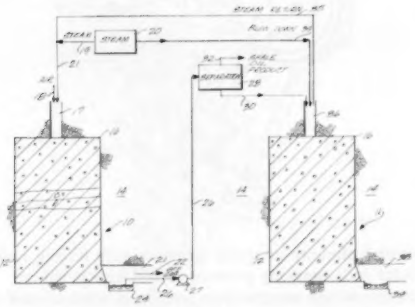
WATER TREATMENT AND HEATING IN SPENT SHALE OIL RETORT

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 30, 1978, Ser. No. 873,667

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—2 **11 Claims**



1. A method for processing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

excavating a first portion of formation to form at least one void within the boundaries of an in situ oil shale retort site;

explosively expanding a second portion of formation within the boundaries of the in situ oil shale retort site towards such a void to form a fragmented permeable mass of formation particles containing oil shale in such an in situ oil shale retort;

retorting the particles containing oil shale in the fragmented mass to produce an in situ fragmented permeable mass of particles containing treated oil shale in a spent in situ retort;

introducing water containing undissolved impurities into an upper portion of the spent in situ retort; and

withdrawing water from a lower portion of the spent retort having a concentration of undissolved impurities lower than the concentration of undissolved impurities in the introduced water.

6. A method for processing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

excavating a first portion of formation to form at least one void within the boundaries of an in situ oil shale retort site;

explosively expanding a second portion of formation within the boundaries of the in situ oil shale retort site towards such a void to form a fragmented permeable mass of formation particles containing oil shale in such an in situ oil shale retort;

retorting the particles containing oil shale in the fragmented mass to produce an in situ fragmented permeable mass of particles containing treated oil shale in a spent in situ retort;

introducing water into the spent in situ retort, at least a portion of the fragmented mass in the spent retort being at a sufficient temperature to generate steam; and

withdrawing steam from the spent in situ retort.

4,178,040

MOVABLE MINING PLANER WITH DIRECTION RESPONSIVE ADJUSTABLE CUTTER DEPTH

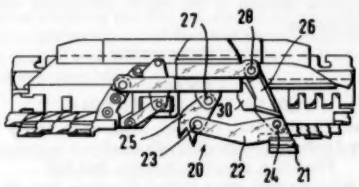
Gerhard Merten, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,969

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707724

Int. Cl.[2] E21C *27/32*

U.S. Cl. 299—34 **16 Claims**



1. A mineral mining plough for winning material in a mineral mining working, the plough being movable to and fro alongside a conveyor, said plough comprising: a plough body, first cutter means on said plough body for winning material lying in a first height range, second cutter means on said plough body for winning material lying in a second height range, said first and second cutter means each consisting of two sets of cutters arranged respectively on opposite sides of said plough body, one of the sets of cutters of said first cutter means being pivotally mounted on said plough body for movement independently of the other set of cutters of said first cutter means, and means for coacting with the mineral face during movement of the plough in one direction to urge the one set of cutters of said first cutter means to a depth of cut greater than that of the remaining sets of cutters on said plough body, and for coacting with the mineral face during movement of the plough in the opposite direction for retracting the said one set of cutters from the mineral face.

4,178,041

WHEEL ATTACHED BALANCING DEVICE

Kim E. Rush, Irvine, Calif., assignor to Khartli, Inc., Danville, Calif.

Filed Aug. 23, 1978, Ser. No. 935,885

Int. Cl.[2] B60B *7/00;* F16F *15/10*

U.S. Cl. 301—5 BA **10 Claims**

1. A wheel attachable balancing device comprising in combination,

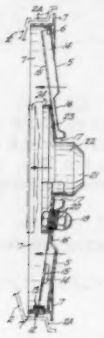
radially expansible means for disposition proximate a circular portion of a wheel and radially displaceable during wheel rotation into engagement with said circular portion,

a hub,

hub support structure carried by said expansible means and locating said hub in coaxial offset relationship with said expansible means,

the entire body of said hub being axially displaceable during wheel rotation by centrifugal force acting on said support

structure, said support structure biasing said radially expansible means during wheel rotation into contact with



the circular portion of the rim to counteract vibratory wheel motion.

4,178,042

VARIABLE-TRACK WHEELS

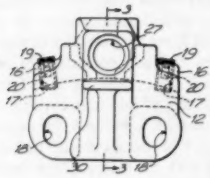
Alec Sykes, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England

Filed Nov. 24, 1978, Ser. No. 963,485

Claims priority, application United Kingdom, Dec. 10, 1977, 51505/77

Int. Cl.[2] B60B *23/12*

U.S. Cl. 301—9 TV **8 Claims**



1. A bracket secureable to a hub having a cylindrical periphery, for connecting the hub to a helical rail secured to the rim of a power-adjustable variable-track wheel, and including a groove in which the rail is slideable and in which a block can be housed so as to be moveable into and out of clamping engagement with the rail by the rotation of an eccentric pin which can be journalled in a bore formed in the bracket and intersecting the groove, wherein at least one screw-threaded hole is provided in the bracket and a screw can be disposed in the hole so as to be capable of abutting against the cylindrical periphery of the hub to enable the position of the bracket radially of the hub to be adjusted prior to securing the bracket to the hub.

4,178,043

SIMULATED WIRE WHEEL TRIM FOR AUTOMOTIVE WHEELS

Hans R. Beisch, Amherstburg, Canada; Frederick A. Apczynski, Livonia, and James E. Gillespie, Westland, both of Mich., assignors to Norris Industries, Inc., Ypsilanti, Mich.

Continuation-in-part of Ser. No. 708,439, Jul. 26, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,628

Int. Cl.[2] B60B *7/00*

U.S. Cl. 301—37 SS **25 Claims**

1. A simulated wire wheel cover comprising:

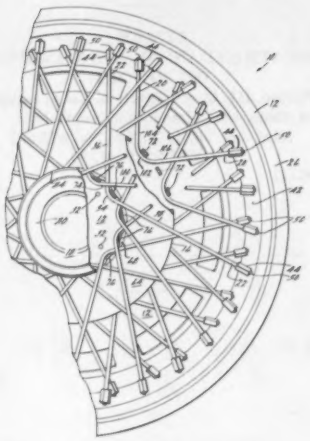
a center hub member;

a circular base member of a diameter greater than said hub member engaging one end of said hub member;

a cap member engaging another end of said center hub member;

a first plurality of spoke members extending radially outward from between said center hub member and said base member;

a second plurality of spoke members extending radially outward from between said center hub member and said cap member, said first plurality of spoke members and said



second plurality of spoke members each having radially outer ends engaging portions of said base member;

retention means secured to a peripheral edge of said base member and operative to retain said wheel trim on a vehicle wheel; and

a plurality of fasteners, each of said fasteners extending between and engaging said base member and said cap member so as to clamp said first plurality of spoke members between said hub member and said base member and said second plurality of spoke members between said hub member and said cap member.

4,178,044

BRAKE MECHANISM FOR TRACTORS

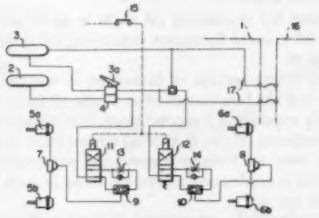
Yuzuru Itoh; Masaaki Ichimura, both of Kawasaki, and Masaru Uenoyama, Ayase, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,374

Claims priority, application Japan, Jul. 15, 1977, 52/93436

Int. Cl.[2] B60T *15/46*

U.S. Cl. 303—47 **4 Claims**



1. A brake mechanism for a tractor comprising an air tank containing compressed air therein, brake valve means connected to said air tank, a brake pedal operatively connected to

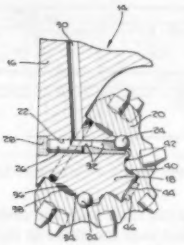
said brake valve, a pair of selector valve means connected to said brake valve means, each of said selector valve means having two positions, a pair of throttle valve means each being connected to one of the outlet ports of said one of the selector valve means, respectively, a pair of double check valve means each being connected to another outlet port of one of said selector valve means at one end thereof, the other end of which being connected to one of said throttle valve means, respectively, two pairs of brake chambers each being connected to one of said double check valve means, respectively, and switch means connected to said selector valve means for changing over the positions thereof.

4,178,045

ABRASION RESISTANT BEARING SEAL

William J. Neilson, Whittier, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 5, 1978, Ser. No. 903,186
Int. Cl.² F16C *19/00*
U.S. Cl. 308—8.2 **12 Claims**



1. An earth boring tool for use in a down-hole environment of abrasive particles comprising:

a rotary tool body,

a journal carried by said body and having a friction bearing surface of revolution,

a cutter rotatable on said journal with a clearance fit providing radial movement relative to said journal with predetermined radial limits, the cutter defining, with said journal, a lubricant space provided by the clearance fit,

one of said journal and cutter having a circumferential seal gland comprising a groove with side walls and a bottom,

said gland being located adjacent an axial limit of the cylindrical friction bearing surface of said journal,

and resilient, radially expansible, axially immutable sealing ring means in said gland in sealing contact with a side wall thereof radially within the predetermined limits and having a circumferential surface in sealing contact with one of said journal and cutter,

said sealing ring means comprising at least one ring having a greater radial cross-section than axial, with a side wall surface, most of which is in sealing contact with a side wall of said groove,

the radial limit of movement of said sealing ring means while in sealing contact with said side wall being at least as great as the radial limit of clearance movement of said cutter.

4,178,046

FOIL BEARING

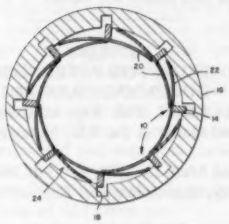
Alexander Silver, Tarzana, and James R. Wenban, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 24, 1976, Ser. No. 689,619
Int. Cl.² F16C *17/00*
U.S. Cl. 308—9 **60 Claims**

11. In combination:

a pair of members arranged for relative rotation with respect to one another, one of said pair of members being adapted to rotatively support the other; and

a plurality of compliant, overlapping bearing foils operably disposed between said pair of relatively rotatable members, each of said plurality of foils having a first free end



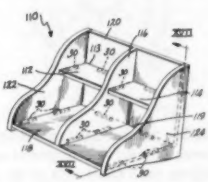
adjacent one of said pair of relatively rotatable members, a second free end extending between said pair of members and overlapping the first free end of an adjacent foil, and means intermediate said first and second ends for mounting each of said foils on said one of said pair of relatively rotatable members.

4,178,047

FURNITURE UNITS WITH CONCEALED FASTENERS AND METHOD THEREFOR

Montgomery J. Welch, East Grand Rapids, Mich., assignor to Modular Systems, Inc., Fruitport, Mich.

Filed Aug. 17, 1977, Ser. No. 825,206
Int. Cl.² F16B *12/00*; A47B *43/00*
U.S. Cl. 312—140 **28 Claims**



1. A furniture unit having no visible fasteners of fastener openings after assembly and panels with side and edge surfaces secured together at joints lying in at least three mutually perpendicular planes, said unit comprising a first panel joined to spaced second and third panels which are parallel to one another but perpendicular to said first panel; said second and third panels in turn being joined to spaced side surface portions of a fourth panel which are parallel and face in the same direction, said fourth panel being perpendicular to all said first, second and third panels; said first and fourth panels being directly and separately secured only to surfaces of said second and third panels without direct attachment to one another; at least said second and third panels being secured to said first panel and thereafter joined as a subunit to said fourth panel; said first and fourth panels being joined to said second and third panels respectively by recessed fastening means for securing said panels together, each joint between said first and said second and third panels and said fourth and said second and third panels having a first portion of said recessed fastening means secured to one panel and receiving a second portion thereof which is secured to an opposite panel; at least one of the abutting joint surfaces at each of the joints being a panel edge surface and including a recessed pocket which opens only to its edge surface and not to another surface of the respective panel; one of said first and second portions of said recessed fastening means being secured to the bottom surface of each of said recessed pockets, the other of said first and second por-

tions being secured to the panel side surface opposite each of said recessed pockets; none of said first and second portions of said recessed fasteners, nor any part of said recessed pockets being visible after assembly of said panels such that said pockets and fasteners are completely covered and hidden by portions of said panels when said first and second fastener portions are engaged and said panels are joined.

4,178,048

CURVED GUIDE FOR PATERNOSTER-TYPE DOCUMENT CARRIERS

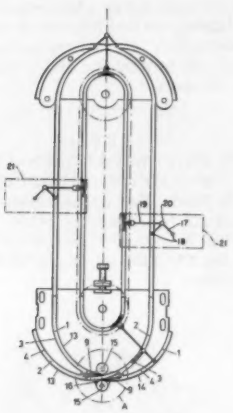
Herbert Zippel, Altdorf, Fed. Rep. of Germany, assignor to Herbert Zippel Gmbh & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,936

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717319

Int. Cl.[2] A47B *49/00*

U.S. Cl. 312—267 **5 Claims**



1. A curved guide for paternoster-type document carriers of the type wherein each carrier is connected by a support arm rotatably articulated on each front side to an endlessly moving chain, said carrier being conducted by means of a bent lever attached to each front side of each carrier in an inverted V-shaped position with the aid of guide rollers provided at the lever ends and running in slotted guideways which intersect at the two deflection points wherein the improvement comprises a pair of pivotally mounted and automatically settable point levers at the guideway intersection, said levers closing the respective entrance and exit of one slotted guideway from the other slotted guideway, the sides of said levers forming a continuous slotted guideway bridging the entrance and exit of said other slotted guideway substantially without a break and means for coupling said point levers, wherein said coupling means comprises a non-rotatable chain sprocket at each point lever and an endless chain intermeshing said chain sprockets.

4,178,049

SHELF BOX WITH DUAL PIVOTING STOP MECHANISM

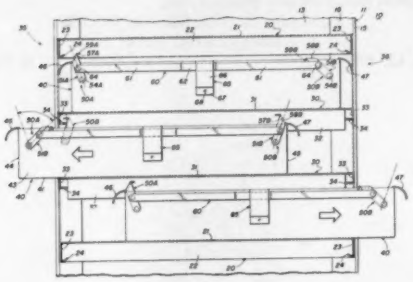
Ricky F. Loo, Batavia, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill.

Filed Jul. 10, 1978, Ser. No. 923,323

Int. Cl.[2] A47B *88/16*

U.S. Cl. 312—286 **14 Claims**

1. A shelf box for use at either side of a shelf rack which is open at opposite sides thereof and includes a plurality of parallel spaced-apart shelves each having two retaining portions extending downwardly therefrom along the entire length thereof, said shelf box comprising an open-top receptacle having opposed ends and being adapted for slidable disposition between adjacent ones of the associated shelves from either side thereof anywhere along the length thereof and dimensioned longitudinally to extend substantially from one side to the other side of the associated rack, with no portion of said receptacle extending above the retaining portions of the overlying shelf, a first stop member mounted on said receptacle adjacent to a first one of said ends for movement between a stop position extending upwardly above the top of said receptacle and engageable with the retaining portions of one of the adjacent shelves and a release position non-engageable with the retaining portions of the shelves, a second stop member mounted on said receptacle adjacent to a second one of said ends for movement between a stop position extending upwardly above the top of said receptacle and engageable with the retaining portions of one of the adjacent shelves and a



release position non-engageable with the retaining portions of the shelves, each of said stop members in the release position thereof accommodating withdrawal of the adjacent end of said receptacle from the associated rack, each of said stop members in the stop position thereof being engageable with one of the associated retaining portions for movement of said stop member to the release position thereof to accommodate withdrawal of the adjacent end of said receptacle from the associated rack and being engageable with the other of the associated retaining portions for limiting withdrawal of the opposite end of said receptacle from the associated rack, and control means for effecting movement of each of said stop members from the release position to the stop position thereof, whereby said shelf box may be opened from either side of the rack while preventing inadvertent complete removal of the shelf box from the rack.

4,178,050

MANUFACTURE OF HALOGEN CYCLE INCANDESCENT LAMPS

Rolf Kiesel, Königsbronn; Gerhard Maier, Herbrechtingen, and Helmut Grahmann, Friedberg, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 755,189, Dec. 29, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,494

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2601576

Int. Cl.[2] H01J *9/18;* C03C *27/02*

U.S. Cl. 316—19 **8 Claims**

1. Method of manufacturing a halogen cycle incandescent lamp having a bulb of hard glass and lead-in wires passing thereinto through a pinch seal comprising, in accordance with the invention, the steps of

providing a length of hard glass tubing (1);

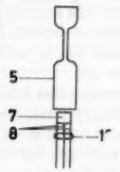
clamping the ends of the hard glass tubing length in clamps (2), heating the tubing intermediate the clamps and drawing apart the hard glass tubing to shape a bulb (5) with a rounded-off bowl (6) and an integrally formed exhaust tube (4);

providing a mount comprising one or more individually connectible filaments (7) and two or more lead-in wires (8);

said mount with the wires being introduced into the bulb (5) with the lead-in wires extending through the open portion of the tubing forming the bulb at the end remote from the exhaust tube;

heating a portion of the bulb through which the mount has been introduced and containing a quantity of about two or more grams of glass substantially uniformly about its circumference to a working temperature at which the glass will soften to a viscosity of approximately 10^{+4} poise, said temperature being sufficient to render the glass plastic but below the temperature at which the glass will wet the lead-in wires;

pinching the heated glass to surround the lead-in wires mechanically in close engagement to form an initial mechanical connection between the mount and said wires and the



thus pinched bulb and to provide a preliminary pinch portion;

withdrawing the pinch tool from the pinched region;

heating the thus pinched region by heating at least those portions of the pinched glass which are immediately adjacent the wires to liquefaction temperature and fusion with the wires to effect wetting of the glass immediately adjacent the wire and intimate merger of the surface of the wire with the glass to form a vacuum tight fusion seal;

then, after the vacuum tight fusion seal is obtained, mold pinching the initially pinched and reheated, fused region in a pinched-mold to mold the pinch region to a desired external shape which is to be retained after the lamp has been made to re-fashion the external shape of the lamp after the heating-to-fusion step; and

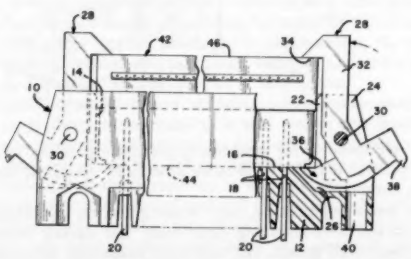
finishing the lamp by filling the lamp with an inert gas through the exhaust tube (4) and tipping off the exhaust tube.

4,178,051

LATCH/EJECT PIN HEADER

Timothy L. Kocher, and Benny M. Bennett, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 21, 1978, Ser. No. 917,762
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 M **8 Claims**



1. A latch/eject pin header comprising:

an elongated housing defining an elongated cavity adapted to receive a mating connector therein;

a plurality of terminal pins fixedly mounted in said cavity;

latch/eject means at each end of said housing, said latch/eject means having a latch arm portion adapted to latchingly engage said connector mated in said header, an eject portion extending into said cavity to engage a mating face of said connector, an actuation portion adapted to impart a rotary motion to said latch/eject means upon squeezing together of the actuating portions at the opposite ends of said housing, and pivot pin means passing through an intermediate section of said latch arm portion rotatably mounting said latch/eject means in said housing, said eject portion and said actuation portion extending in substantially opposite directions to one side of said pivot pin, and substantially normal to said latch arm portion on the opposite side of said pivot pin,

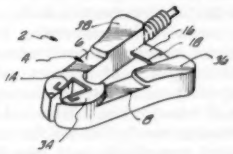
whereby insertion of said mating connector into said housing brings the connector into driving engagement with said eject portion causing rotation of said latch arm portions into latching engagement with said connector and squeezing together of said actuation portions causes reverse rotation freeing said latch arm portions from said connector and driving said eject portion against said connector to remove it from said housing.

4,178,052

MEDICAL TERMINAL CLIP MEMBER FOR ATTACHMENT TO PATIENT ELECTRODES

Roger A. Ekbom, Newport Beach, and Sidney Friedlander, Encino, both of Calif., assignors to Tronomed, Inc., Costa Mesa, Calif.

Filed Oct. 13, 1977, Ser. No. 841,810
Int. Cl.[2] H01R *11/22*
U.S. Cl. 339—61 R **11 Claims**



1. A medical terminal clip member for attachment to electrodes connected to a patient comprising;

a body member made out of a relatively soft plastic material having a longitudinal axis and a pair of laterally spaced leg members extending in an approximately longitudinal direction and pivotally connected for relative movement, the spaced leg members forming a variably spaced electrode receptacle on one side of the pivotal connection;

conductive means supported by the body member and strengthening each laterally spaced leg member and further electrically connected to the electrode receptacle includes an approximately U-shaped receptacle and a pair of side members connected to and extending respectively from each end of the receptacle, each side member including a flange, and

a flexible shield member having a greater width along the longitudinal axis than its thickness traverse to the longitudinal axis is formed from the plastic material, the shield member further has a recessed central crease extending along the longitudinal direction so as to form an approximately shallow V-shape in a plane traverse to the longitudinal axis whereby either side of the flexible shield member pivots about the crease and come closer together when the respective leg members are depressed to open the electrical receptacle cavity, the flexible shield closes longitudinal access to the space between the leg members

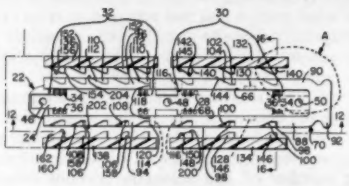
to prevent dislocation of the terminal clip member from the electrode by catching onto an exterior object.

4,178,053

ZERO-INSERTION FORCE ELECTRICAL CONNECTOR

Ralph C. Eifort, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 13, 1978, Ser. No. 877,432
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 MP **7 Claims**



1. A substantial zero-insertion force, electrical connector comprising:

a member having a slot therein to receive a complementary member;

first and second groups of contacts located in said member to engage said complementary member; and

actuating means including an actuating member for sequentially moving the contacts of said first and second groups between first and second positions whereby said actuating member, when moved in a first direction, is effective to move the contacts of said first group to said second position and whereby further movement of said actuating member in said first direction is effective to move the contacts of said second group to said second position to enable said complementary member to be inserted in said slot with substantial zero-insertion force;

said actuating means further comprising first and second pairs of retractor means operatively connected with said first and second groups of contacts, respectively, and further comprising means interconnecting said first and second pairs of retractor means with said actuating member, said actuating member having first and second portions associated respectively with said first and second groups of contacts for sequentially moving the contacts of said first and second groups from said first position to said second position as said actuating member is moved in said first direction;

said first portions of said actuating member having first abutment areas thereon and said second portions of said actuating member having second abutment areas thereon, which said first and second abutment areas are arranged on said actuating member to coact with each other to enable said second group of contacts to be moved to said second position after said first group of contacts is moved to said second position as said actuating member is moved in said first direction.

4,178,054

PLUG TERMINATION FOR COAXIAL CABLE

Ronald C. Laudig, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 22, 1977, Ser. No. 826,801
Int. Cl.[2] H01R *11/08, 17/08*
U.S. Cl. 339—95 R **1 Claim**

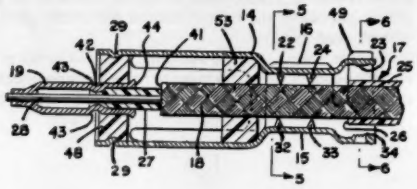
1. In a plug type connector body having an inner center contact connected to a center conductor of a coaxial cable and an outer one-piece connector shell connected to the conductive sheath of the cable and separated from the center contact and center conductor by dielectric material, the improvement comprising:

said shell being partially divided into first means and first and second split barrel sections;

said first means being deflectable resiliently in a direction radially of said cable for an internal frictional fit upon making a plug-in electrical connection with said plug type connector body.

said first split barrel section compressibly encircling and engaging said conductive sheath;

said second split barrel section compressibly encircling an outer jacket of said coaxial cable which covers said conductive sheath;



said shell including second means integral with a first end of said shell and extending towards said first and said second split barrel sections and being compressibly encircled and engaged by each of said split barrel sections;

said second means including an integral projecting lance internally of said encircling first split barrel section and penetrating into said sheath;

said second means including a second integral projecting lance internally of said encircling second split barrel section and penetrating into said jacket; and

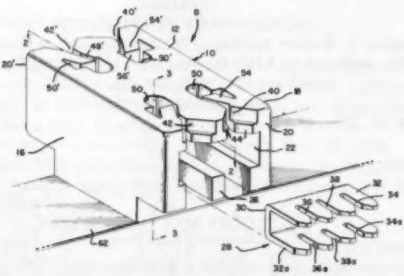
said first and second split barrel sections including projecting lances which penetrate into said sheath and said jacket, respectively.

4,178,055

CONNECTING DEVICE FOR CONNECTING PAIRS OF WIRES

James E. Fleischhacker, Winston-Salem, N.C., and Henry G. Wasserlein, Jr., Seminole, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 576,831, May 12, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,069
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—98 **3 Claims**



1. A connector for connecting the corresponding wires of two pairs of wires to each other in separate electrical connections comprising:

an insulating housing, said housing having oppositely directed wire-receiving open ends and having front and back wall means, and sidewalls extending between said ends, an internal barrier wall, said barrier wall being located between said open ends and extending from said

front wall to said back wall, said barrier wall defining pockets in said housing which extend inwardly from said open ends to said barrier wall,

each of said pockets having an electrical connecting means therein, each of said connecting means being receptive to at least two wires upon locating said wires adjacent to said open ends with the axes of said wires extending substantially normally of said front and back wall means and thereafter moving said wires laterally of their axes and into said wire-receiving open ends, each of said pockets having wire holding means therein disposed between said electrical connector means and said back wall,

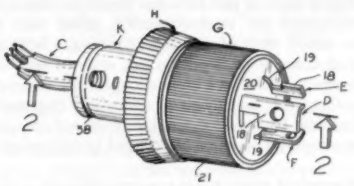
said front and back wall means extending past said connecting means in each of said pockets, said front wall means having wire admitting slot means extending partially thereacross from each of said wire-receiving ends towards said barrier wall whereby, upon locating the corresponding wires of said pairs adjacent to each end said connector and besides said wire-receiving open ends with portions of said wires extending substantially normally of said front wall means, upon moving said wires laterally of their axes towards, and into, said wire-receiving ends, and trimming said wires in the plane of said back wall means, portions of said wires move through said wire admitting slot means and into said pockets and are received by said electrical connecting means thereby electrically to connect said corresponding wires to each other.

4,178,056

ELECTRIC PLUG WITH NOVEL CABLE SECURING MEANS

Hop Lee, 2455-24th Ave., San Francisco, Calif. 94116

Filed Jun. 15, 1978, Ser. No. 915,927
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 R **1 Claim**



1. In an electric plug:

(a) a cable holding member having a longitudinal bore for receiving a cable carrying a plurality of wires;

(b) a cable gripping member positioned in a recess which opens into the bore in said cable holding member, said gripping member having a tongue extending through an opening in said cable holding member;

(c) adjustable means on said cable gripping member for forcing a pronged portion thereof into gripping engagement with the cable;

(d) a metal sleeve enclosing a portion of said cable holding member and having an opening for receiving said tongue;

(e) a spacing member receivable in the recess in the cable holding member and positioned between said cable gripping member and the interior of said sleeve;

(f) said adjustable means including a bolt whose head extends through an opening in said sleeve and having a nut-carrying head secured to a nut-carrying member, the other end of said bolt bearing against said pronged portion and the bolt shank received in said nut; and

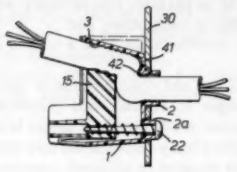
(g) whereby a rotation of said bolt in said nut will move the nut-carrying member into binding engagement with said spacing member and will force said pronged portion against the cable for anchoring it in the cable holding member.

4,178,057

CLIP FOR FIXING AN ELECTRIC CABLE TO A SUPPORT STRUCTURE

Mathew McCormick, East Didsbury, England, assignor to Bowthorpe-Hellermann Limited, Crawley, England

Filed Dec. 2, 1977, Ser. No. 856,965
Claims priority, application United Kingdom, Dec. 8, 1976, 51280/76
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 M **6 Claims**



1. A clip for securing one end of a multi-conductor electric cable to a support panel, comprising

(a) a generally trapezoidal hollow body member the larger forward end of which contains a recess defining a chamber, the upper and lower walls of said chamber diverging outwardly from the rear wall of said chamber toward the forward end of said body member, (1) said body member rear wall containing a pair of openings surrounded by outwardly extending cylindrical collar portions, respectively, said collar portions being adapted to be received by corresponding openings contained in said support panel;

(2) said body member also including adjacent its forward end a pair of laterally outwardly extending projecting portions;

(b) a closure member adapted for insertion within, and having external walls corresponding with the walls of, said recess chamber, said closure member including a bore arranged colinearly with a first one of said rear wall openings;

(c) a pair of electrical terminals mounted on the forward portions of said projecting portions, respectively, said terminals being so arranged that when a cable is inserted into the recess through the other one of said openings, the cable conductors extend forwardly from the recess for connection with said terminals, respectively; and

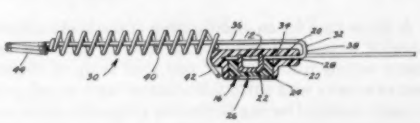
(d) screw means extending through said first opening and into said bore for drawing said closure member into said recess, thereby to clamp said cable between corresponding wall surfaces of said closure member and the recess chamber wall, said screw means including a head portion having a greater diameter than said first opening, whereby upon tightening said screw means, said head portion flattens the extension defined by said collar portion associated with said first opening to connect the clip with said support panel.

4,178,058

TEST PROBE FOR TELEPHONE WIRE CONNECTOR

John H. Swenson, Big Lake, Minn. 55309

Filed Jun. 8, 1978, Ser. No. 913,581
Int. Cl.[2] H01R *13/38, 13/54*
U.S. Cl. 339—108 TP **1 Claim**



1. An electrical test probe for use with two parallel, spaced-apart, electrically spliced together, insulated electrical lines

having the spliced portion encapsulated in a splice body of insulating material, the splice body being provided with an opening from an electrically conducting portion of said splice within the body to position outside the body between the two electrical lines; said probe including:

A. a single, integral, hook-shape rod of electrically conducting material, said rod having:

(1) a short finger,

(2) a long finger,

(3) an intermediate finger portion electrically connecting a first end of each of the long and short fingers to each other to be in parallel, spaced-apart, adjacent physical relationship to each other, and

(4) a handle member situated at a second end of said long finger,

said rod being of size and configuration to cause a second end of said short finger to contact said electrically conducting portion of the splice when the short finger is inserted into the opening in the splice body between the two electrical lines and the long finger is situated in adjacent, parallel relationship to the splice body; and

B. a compression coil spring surrounding said long finger, said spring having an integral splice body retaining arm extending outwardly from an end of said spring opposite said rod handle, said spring and retaining arm bearing on said handle and on said splice body to firmly hold said second end of said short finger in contact with an electrically conducting portion of the splice within the splice body.

4,178,059

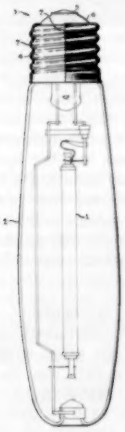
ALUMINUM BASE FOR ELECTRIC LAMPS HAVING A PLASTIC COATING FOR IMPROVED CORROSION RESISTANCE

Stanley F. Bubar, Chagrin Falls, and David L. Jennings, Reminderville, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,228

Int. Cl.[2] H01R *3/02*

U.S. Cl. 339—115 R **7 Claims**



1. A screw base for an electric lamp of the kind comprising a threaded metal shell and a center contact mounted on an insulator uniting it to the shell, said shell being of aluminum coated externally with a thin self-adherent layer of soft protective plastic material having lubricative properties and a coefficient of friction less than 0.1, said layer being penetrable at points of maximum contact pressure when screwed into a socket in order to provide circuit continuity, said layer otherwise remaining in place to provide protection against corrosion of the aluminum and serving as a lubricant for easy lamp removal from the socket.

4,178,060

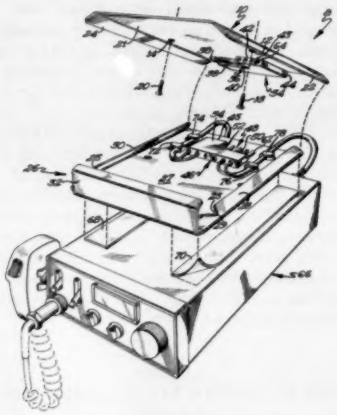
MOUNT FOR A COMMUNICATION DEVICE OR THE LIKE

James G. Coffey, 2516 Lee Ave. No., Minneapolis, Minn. 55418

Filed Mar. 30, 1978, Ser. No. 891,514

Int. Cl.[2] H01R *9/16;* **H02B** *1/02*

U.S. Cl. 339—125 R **3 Claims**



1. A mount for a C.B. radio and the like having an upper plate and a lower plate slidably mounted thereon, said upper plate having a first terminal block and said lower plate having a second terminal block for mating engagement with said first terminal block, each of said terminal blocks having a male and female connector for interconnection when said terminal blocks are mated, each of said blocks having a hole in which each of said connectors is positioned, each of said male and female connectors having a pair of oppositely disposed barbs extending therefrom and a pair of oppositely disposed flanges spaced from said barbs and extending from said connector, the improvement in said terminal block, said improvement including

(a) said terminal block having means adjacent each of said holes for engagement with said barbs of each of said connectors and simultaneously with said flanges when said connectors are inserted in said holes.

4,178,061

FUSED ELECTRICAL PLUG

Joseph M. Ahroni, 1631 16th Ave., Apt. 413, Seattle, Wash. 98122

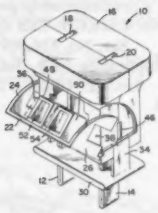
Filed Feb. 15, 1977, Ser. No. 768,771

Int. Cl.[2] H01H *85/12, 85/22;* **H01R** *13/68*

U.S. Cl. 339—147 P **38 Claims**

1. In a fused electrical plug having a plug body formed with a pair of fuse recesses, a pair of electrical conductors entering said body and terminating in respective contact members in said fuse recesses, a pair of parallel conductor prongs projecting through the forward end of said plug body for insertion into a socket, a pair of removable electrical fuses positioned in said fuse recesses and connecting each of said contact members to a respective said conductor prong, the improvement comprising access door means on the plug body movable independently of said fuses between an open position allowing said fuses to be removed from said recesses and a closed position preventing access to said fuses, access door securing means including a locking plate having a pair of prong receiving slots allowing said plate to slide along said prongs to a locking position wherein said plate abuts the forward end of said plug

body, and access door locking means operatively associated with said locking plate for maintaining said access door in its



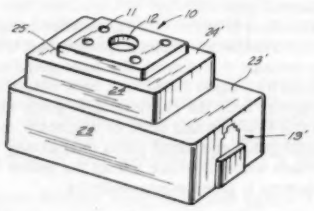
closed position when said locking plate is in its locking position, thereby preventing access to said fuses when said prongs are inserted in said socket.

4,178,062

MODULAR TELEPHONE CONNECTING BOX

Edward Abbo, 24 Woodhaven Dr., New City, N.Y. 10956

Filed Jul. 28, 1978, Ser. No. 928,886
Int. Cl.[2] H01R *33/76*
U.S. Cl. 339—154 A **5 Claims**



1. A modular telephone connecting box, comprising a housing having a top surface, side walls and an open bottom; a first telephone connecting receptacle provided inside said housing in operative proximity to the top portion thereof and having a plurality of contact passages passing through said top surface; a second telephone connecting receptacle mounted inside said housing in operative proximity to one side wall thereof and having a plurality of contacts, said one side wall defining an opening opposite to said second receptacle for receiving a telephone plug matching said second receptacle; a contact plate secured inside said housing opposite to said first receptacle and parallel to said top surface; a plurality of bolt nuts embedded in said contact plate and being electrically connected to corresponding contact passages of said first receptacle, said contacts of said second receptacle being connected to said bolt nuts, respectively; and a plurality of contacting elements projecting toward said open bottom and each being screwable into an assigned bolt nut.

4,178,063

REJECTION TYPE FUSE CLIP ASSEMBLY

Howard Reynolds, New Britain, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,366
Int. Cl.[2] H01K *13/16*
U.S. Cl. 339—259 F **2 Claims**

1. A fuse clip assembly capable of accepting only cartridge fuse terminal ferrules keyed with an annular groove, said assembly comprising, in combination:

A. a fuse clip having a pair of spaced, generally parallel, flexible clamping arms upstanding from an intermediate base, said clamping arms defining therebetween a pocket for accommodating the terminal ferrule of a cartridge fuse;

B. a rejection member having

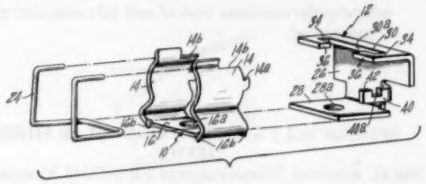
(1) an upright body arranged transversely of said pocket to the rear of said clip,

(2) a shoulder bent over from the top of said body for horizontal extension toward said clip and terminating in an end stop edge for locating the longitudinal position of a grooved fuse terminal ferrule in said pocket,

(3) a foot extending from the lower end of said body into overlapping relation with said clip base,

(4) a pair of rejector arms extending from said shoulder at each side of said end stop edge for disposition immediately above said pocket,

(5) an interference element carried at the end of each said rejector arm, said interference elements cooperating to



obstruct the downward insertion into said pocket of a fuse terminal ferrule lacking the annular groove,

(6) the upper rear corners of said clamping arms being relieved to avoid interference with the extensions of said rejector arm pair and the interference elements borne thereby,

(7) an additional rejector arm extending from a lower portion of said body for disposition between said clamping arms generally beneath said pocket, and

(8) an additional interference element carried by said additional rejector arm for upward extension into said pocket, said additional interference element obstructing endwise insertion of a fuse terminal ferrule from below the level of said interference elements carried by said rejector arm pair; and

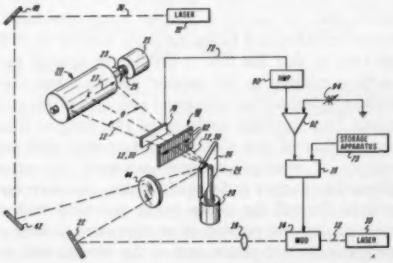
C. an essential non-removable fastener clamping said rejection member foot to said fuse clip base and the latter in electrical connection with a conductive terminal strap.

4,178,064

REAL TIME GRATING CLOCK FOR GALVANOMETER SCANNERS IN LASER SCANNING SYSTEMS

Peter Mrdjen, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1978, Ser. No. 900,460
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.6 **8 Claims**



1. Reproduction apparatus comprising:

first laser means for generating a writing light beam,
means for modulating said light beam,
a medium sensitive to said light beam and to modulations thereof,
galvanometer means having a sinusoidal displacement characteristic for causing said light beam to scan the sensitive medium at a predetermined scanning rate, said galvanometer means oscillating in a resonant mode, and
means for controlling the modulation of the beam with respect to said scanning rate comprising second laser means for generating a timing light beam, said galvanometer means causing the timing beam to scan a timing means in synchronism with the writing beam, and means responsive to transmission of said timing light beam through the timing means and adapted to release timing signals in response thereto, said timing signals being coupled to said modulating means whereby said modulated light beam is reproduced on said sensitive medium in a manner whereby the nonlinear scan of said galvanometer means is compensated.

4,178,065

SPHERICALLY SHAPED TRIANGULAR MIRROR DEVICE

Nils G. Åkerlund, Rönnbergagatan 32, S-72346 Vesteras, Sweden

Filed May 1, 1978, Ser. No. 901,490
Int. Cl.[2] G02B *7/18*
U.S. Cl. 350—295 **2 Claims**

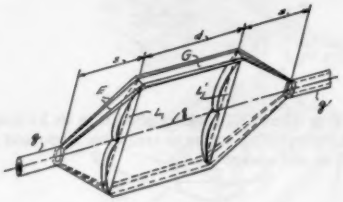
1. A mirror device, comprising:
a spherically shaped disc of triangular shape having rounded corner portions and having an outwardly curved surface which acts as a mirror;
a carrying member rigidly attachable to the spherically shaped disc, the carrying member being attachable to a support member and being hingedly settable in different positions so that the disc is settable in several inclined positions relative to the support member, the carrying member including two elongated and rigid plates gripping around two opposite surfaces of the disc, at first end portions thereof said plates being provided with support washers of resilient material arranged for abutment against the opposite surfaces of the disc, and at second end portions thereof the plates being provided with holes, whereby one end portion of an elongated flexible rod is attachable to said plates, and at the second end portion thereof the rod is fixedly attached to an attaching member which is fixedly attachable to the support member.

4,178,066

RAY-PATH EQUALIZER FOR SIGNAL-TRANSMISSION SYSTEM USING MULTIMODE LIGHT GUIDES

Pietro Di Vita, Torino, Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Torino, Italy

Continuation-in-part of Ser. No. 779,821, Mar. 21, 1977, Pat. No. 4,128,302, and a continuation-in-part of Ser. No. 793,420, May 3, 1977, Pat. No. 4,134,639. This application Jul. 15, 1977, Ser. No. 816,209
Claims priority, application Italy, Jul. 16, 1976, 68784 A/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.18 **8 Claims**



1. In an optical signal-transmitting system, in combination:
two aligned light guides with confronting ends respectively emitting and collecting bundles of light rays whose limiting rays include a critical angle Θ_M, of a magnitude for which $\Theta_M \approx \tan \Theta_M$, with a common axial line of said light guides in at least one longitudinal plane of symmetry thereof; and
an equalizer between said light guides comprising two identical transparent elements spaced apart from each other by a distance d and from the light-guide ends proximal to them by a equal distances s, each of said elements refracting rays from the proximal light-guide end, incident at an angle Θ within said plane of symmetry, toward the remote light-guide end along paths intersecting said axial line at points whose distance x from the center of the respective element is given substantially by

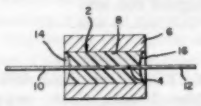
$$\frac{1}{x} = \frac{1}{d} \cdot \left[1 \pm \sqrt{\left(\frac{s \cdot \Theta_M}{r} \right)^2 - 1} \right].$$

4,178,067

SPLICING OPTIC WAVEGUIDES BY SHRINKABLE MEANS

Tore R. Johnson, Harrisburg; Emerson M. Reyner, II, Palmyra, and Roman S. Slysh, Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 19, 1978, Ser. No. 870,558
Int. Cl.[2] G02B *5/14;* F16L *25/00;* B65H *69/02*
U.S. Cl. 350—96.21 **3 Claims**



1. An optic waveguide splice, comprising:
an outer, dimensionally stable sleeve containing a mass of dimensionally unstable material;
a pair of optical waveguides received into opposite ends of a reduced diameter bore extending axially through said mass and having an initial diameter sufficient to receive freely the ends of said waveguides therein;
said mass adapted for axial shrinkage and radial volumetric

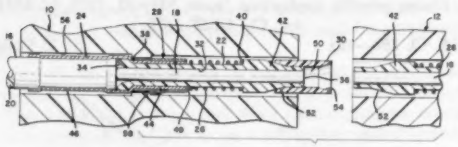
expansion against said stable sleeve and inwardly in compression against said waveguides to move the ends thereof into adjacent colinear axial alignment.

4,178,068

FIBER OPTIC CABLE TERMINATION MEANS

Charles D. Hoover, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 14, 1977, Ser. No. 851,339
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **6 Claims**



1. A preassembled optic cable connector which is spring loaded and self-latching upon insertion thereof within a housing provided with a cavity for mounting said connector, comprising:

a unitary ferrule having a concentric bore in which is mounted a light transmitting core of an optic cable with a polished end of said core at a mating forward end of said ferrule,

a rearward end of said ferrule being joined to said optic cable by a crimp sleeve encircling and radially gripping both said ferrule rearward end and said optic cable,

said crimp sleeve having a projecting shoulder to limit forward movement of said ferrule and said cable in a connector housing cavity,

a retention sleeve slideably mounted over said crimp sleeve and having means projecting therefrom to limit rearward movement of said retention sleeve in a connector housing,

said means being capable of deflection in response to forward movement of said retention sleeve in a housing cavity,

said crimp sleeve shoulder being engagable against a rearward end of said retention sleeve to limit forward movement of said ferrule and said cable relative to said retention sleeve, and

a helically coiled spring freely encircling said ferrule and having a forward end engagable against a projecting shoulder portion of said ferrule,

a rearward end of said spring being engagable against a forward end of said retention sleeve with the coils of said spring being resiliently compressed by movement of said ferrule and said cable rearwardly relative to said retention sleeve.

4,178,069

PROCESS FOR PREPARING AN OPTICAL ELEMENT FOR INCORPORATION INTO OPTICAL TRANSMISSION MEANS

Axel Andersen, Gentofte; Poul U. Knudsen, Hellerup, and Knud B. Jensen, Skodsborg, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-Traadfabriker, Copenhagen, Denmark

Filed Nov. 4, 1977, Ser. No. 848,696
Claims priority, application Denmark, Nov. 9, 1976, 5050/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.23 **17 Claims**

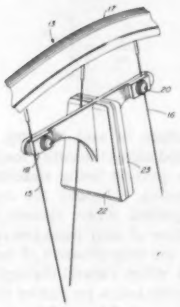
14. An optical transmission means comprising an optical element placed in a tubular jacket, said element comprising an optical fiber provided with a tight-fitting coating, and to which element is imparted such a permanent preshape that when placed in the tubular jacket the element has a marked tendency to assume by itself a curve shape with a radius of curvature sufficiently big to avoid a substantial increase of the loss at light transmission, said permanent preshape being brought about by establishing in the coating elastic tensions which vary over the cross-sectional area of the element.

4,178,070

BICYCLE SAFETY DEVICE

Robert W. Thibodeau, Sr., 17 Gendron La., Kennebunk, Me. 04043

Filed Jun. 25, 1976, Ser. No. 699,940
Int. Cl.[2] G02B *5/12*
U.S. Cl. 350—99 **6 Claims**



1. A bicycle safety device comprising a pair of reflector assemblies mounted at substantially diametrically opposed positions on a wheel; each said assembly being mounted near the periphery of the wheel; each reflector assembly being characterized as having a reflector surface facing rearwardly and a reflector surface facing forwardly; each said reflector surface extending outwardly on both sides of the wheel; the rearward and forward facing reflector surfaces of each assembly being of different and contrasting colors with both rearward facing reflectors being of one color and both forward facing reflectors being of the different and contrasting color; said device being so characterized that when said wheel spins, a flashing effect is observed when there is incident light from the rear or front as a result of the reflection of rapidly alternating contrasting colors; said device being further characterized in that the flashing effect is clearly visible even when illumination of the reflective surfaces is low so as to provide a visible signal from the headlights of an automobile at a great distance.

4,178,071

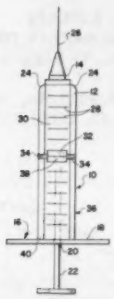
MAGNIFYING CYLINDER FOR INSULIN SYRINGE

Burma B. Asbell, 1114 NE. 8th Ave., Gainesville, Fla. 32601

Filed Oct. 26, 1977, Ser. No. 845,484
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—116 **9 Claims**

1. A magnifying cylinder for a syringe-like housing having a medicament receiving and a finger gripping flange-like portion at one end thereof comprising an elongated tubular body portion, said elongated tubular body portion having a slit disposed extending along the length thereof parallel to the longitudinal axis of the passageway therein and communicating with the entire length of said passageway, said body portion having a transparent portion, said transparent portion configured so as to provide magnification when viewed therethrough into and along the length of said passageway, a movable lens, a pair of straps, said pair of straps secured to said movable lens, said pair

of straps and said movable lens configured to be slideably frictionally engaged along the exterior surface of said body portion, an indicia line, said indicia line carried by said movable lens, said indicia line extending transverse to said longitudinal axis of said body portion when said movable lens is slideably engaged thereon, means to locate one end of said body portion touching said finger gripping portion when substantially the entire interior surface of said body portion defining said passageway is disposed frictionally, clampingly engaged



on the exterior surface of said housing, said body portion substantially extended along the entire length and girth of said housing, said body portion being slideable on said exterior surface of said housing, whereby the entire length of said passageway is magnified when viewed through said body portion and a portion of said passageway is magnified to a greater extent than the magnification of the remaining portion of said passageway when viewed through said movable lens and when said movable lens is carried by said body portion and said body portion is carried by said housing.

4,178,072

OPTICAL SYSTEMS

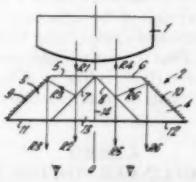
Philip J. Rogers, Meliden, Wales, assignor to Pilkington P. E. Limited, Merseyside, England

Continuation-in-part of Ser. No. 687,876, May 19, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,628

Claims priority, application United Kingdom, Jun. 7, 1975, 24654/75; Dec. 2, 1976, 50242/76

Int. Cl.[2] G02B *27/02*

U.S. Cl. 350—145 **45 Claims**



1. Optical apparatus for biocular viewing comprising a collimating magnifier lens for producing a magnified image of an object to be viewed and having an optical axis, and means positioned to receive light from the lens and providing a pair of partially transmitting/partially reflecting interfaces between solid parts, the interfaces being disposed respectively on opposite sides of and inclined relative to the optical axis so as to converge in a direction towards the lens, and further providing a pair of reflecting faces located respectively on opposite sides of the optical axis and each positioned further from the optical axis than the partially transmitting/partially reflecting interfaces on that side, each said reflecting face being parallel to the partially transmitting/partially reflecting interface on the same side of the optical axis and disposed so as to reflect rays of light received from the lens via the partially transmitting/partially reflecting interface towards an observer in parallel relationship with rays of light received from the lens and travelling from the partially transmitting/partially reflecting interface towards the observer thereby to provide on each side of the optical axis plural light paths by which said image can be viewed.

4,178,073

OPTICAL ISOLATOR

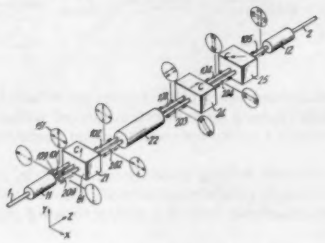
Teiji Uchida, and Atsufumi Ueki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,116

Claims priority, application Japan, May 31, 1977, 52/64315

Int. Cl.[2] G02F *1/09*

U.S. Cl. 350—151 **11 Claims**



1. An optical isolator comprising, a first means of polarization for dividing an incident light beam into two linearly polarized light beams having their directions of polarization perpendicular to each other, a non-reversible rotation element for rotating each of said linearly polarized light beams to form two rotated linearly polarized light beams, a polarization converting means and a second means of polarization which is responsive to said polarization connecting means for synthesizing said two rotated linearly polarized light beams.

4,178,074

HEAD-UP DISPLAYS

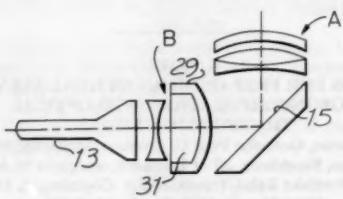
Fritz P. Heller, Bromley, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Mar. 16, 1978, Ser. No. 887,071

Claims priority, application United Kingdom, Mar. 28, 1977, 12926/77

Int. Cl.[2] G02B *27/14*

U.S. Cl. 350—171 **5 Claims**



1. An optical projector for the display unit of a head-up display system comprising:

(A) a first optical display surface;

(B) a first collimating optical system for light from said first display surface, the said first optical display system being of the Petzval type and including

(i) a first lens group and

(ii) a second lens group,

(iii) said first lens group being closer to the first display surface than the second lens group,

(C) the first lens group including a lens having a optically flat peripheral surface,

(i) said lens having a first surface proximal to said first display surface and

(ii) a second surface distal to said first display surface,

(iii) said first and second lens surfaces being transverse to the optical axis of the first lens group,

(iv) said distal lens surfaces being curved, and

(D) an interior flat dichroic film which is transmissive to light from said first display surface and which extends at an angle to the optical axis of the first lens group from said second surface to and reaches said first surface;

(E) a second optical display surface laterally displaced with respect to the said lens and parallel to the said flat peripheral surface, and

(F) between the second display surface and said flat peripheral surface, an optical arrangement which, with the curved distal surface of said lens and those optical elements down stream from the said lens, forms a collimating optical system for light from the second display surface reflected by the dichroic film.

4,178,075

LENSES WITH DISTORTION

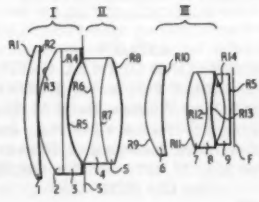
Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P. E. Limited, St. Helens, England

Filed Feb. 1, 1978, Ser. No. 874,311

Claims priority, application United Kingdom, Feb. 10, 1977, 5649/77

Int. Cl.[2] G02B *9/60, 9/62*

U.S. Cl. 350—175 FS **20 Claims**



1. An objective lens which introduces barrel distortion at the edges of its field of view, the lens comprising a front part of positive power consisting of at least one positive lens element, a middle part of negative power consisting of at least two lens elements, one of which is of negative power and of a dispersive material and the other of which is of positive power but less powerful and of a less dispersive material than the negative power element, a back part of positive power and consisting of at least two components of positive power and with front convex surfaces, at least one of the components being a doublet which corrects residual lateral chromatic aberration, and a field-flattening element of negative power, wherein the middle part of negative power corrects residual spherical aberration of the front and back positive parts and lowers the residual Petzval sum which is further reduced by the negative field-flattening element, and wherein the front convex surfaces of the components of the back part of positive power contribute to barrel distortion.

4,178,076

MACRO ZOOM LENS

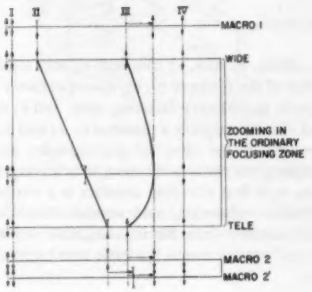
Sadahiko Tsuji, Yokohama, and Yujiro Agari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

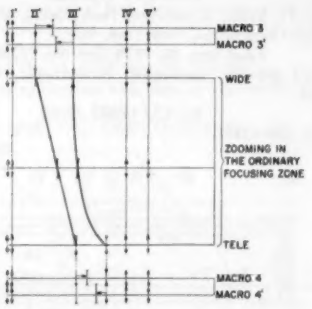
Division of Ser. No. 857,692, Dec. 5, 1977, Pat. No. 4,113,355, which is a continuation of Ser. No. 585,654, Jun. 10, 1975, abandoned. This application May 5, 1978, Ser. No. 903,174

Claims priority, application Japan, Jun. 17, 1974, 49-68883

Int. Cl.[2] G02B *15/18*

U.S. Cl. 350—184 **6 Claims**





1. A macro zoom lens capable of taking close-up photography, at the edge of the wide and tele-side of the zooming zone, comprising:

focusing means, zooming means, and fixed image forming means arranged in the written order from an object side, said focusing means for focusing at an ordinary photographing distance, said zooming means including a first movable member and a second movable member, said fixed image forming means for focusing a light flux from said zooming means on a film;

at least one of said first movable member and second movable member being movable at the time of close-up photography;

said first and second movable members being within a zooming space during close-up photography in which said first and second movable members move at the time of zooming;

said first and second movable members being positioned at a position in said zooming space at the time of a close-up photograph from the wide edge and being positioned at a different position in said zooming space at the time of close-up photography from the tele-edge;

wherein the distance between said focusing means and the image forming means being substantially constant both at the time of close-up photography and at the time of photography at an ordinary distance,

the distance (e_1) between the focusing means and the first movable member,

the distance (e_2) between the first movable member and the second movable member, and

the distance (e_3) between the second movable member and the image forming means satisfy the following conditions:

$$e_1 \min \leqq e_1 \text{macro}$$

$$e_2 \min \leqq e_2 \text{ macro}$$

$$e_3 \min \leqq e_3 \text{ macro}$$

in which, e_1 min, e_2 min and e_3 min signify a minimum value of the distance e_1, e_2, e_3 respectively in the zooming state in an ordinary focusing zone, and e_1 macro, e_2 macro and e_3 macro signify a distance e_1, e_2 and e_3 respectively at the time of the close-up photography and wherein said focusing means is a focusing lens having positive refraction, said first movable member is a variator lens having negative refraction, said second movable member is a compensator lens having negative refraction and the image forming means is a basic lens having positive refraction.

4,178,077

ELECTROSTATICALLY CONTROLLED PICTURE DISPLAY DEVICE

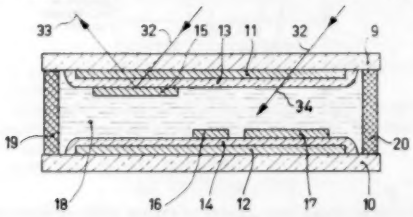
Ties S. Te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,429

Claims priority, application Netherlands, Aug. 27, 1975, 7510103

Int. Cl.[2] G05D *25/00*

U.S. Cl. 350—285 **4 Claims**



1. A passive picture display device which comprises: a plurality of display elements for controlling the reflection or the transmission of light, each display element comprising a first electrode, a second electrode and a third electrode, said third electrode being movable between said first and the second electrodes by electrostatic force, said device further including first and second supporting plates disposed in parallel spaced relationship with at least portions of said first and second supporting plates facing each other, said first supporting plate being transparent, said first and said second electrode of each display element being disposed respectively on facing surfaces of said first and second supporting plates, and said third electrode of each display element being movably disposed between said first and second supporting plates, said first electrode on the said first supporting plate being transparent and the space between said supporting plates being filled with an opaque liquid the color of which contrasts with the color of the side of said third electrodes facing said first supporting plate, said third electrode being provided with a pattern of light transmitting areas and the electrode on one of said supporting plates comprising a pattern of differently colored areas which are disposed in registered relationship with said light transmitting areas of said third electrodes.

4,178,078

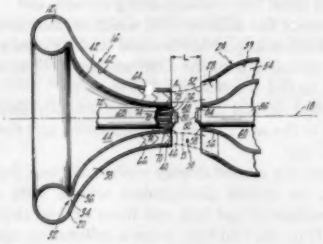
AERODYNAMIC WINDOW

George F. Hausmann, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 19, 1978, Ser. No. 944,055

Int. Cl.[2] G02B *5/00*

U.S. Cl. 350—319 **18 Claims**



1. An apparatus adapted for providing an aerodynamic window capable of enveloping annularly a cavity therein to maintain a gas within the cavity at a desired pressure comprising:

a truncated injector, having an annular configuration symmetrically disposed about a center line axis, adapted for expanding a first gas to supersonic velocity to provide a flow of first gas through a flow path having a cylindrical configuration with an annular cross section;

an annular collector, disposed symmetrically about the center line axis in a spaced apart relationship with the truncated injector, having an annular collection duct in flow alignment with the truncated injector and the flow path wherein the annular collector cooperates with the annular injector and the flow path to define a cavity therebetween; and

means for providing a flow of second gas into the cavity, said means adapted for maintaining the second gas within the cavity at a desired pressure level while said first gas flows through the flow path to form an aerodynamic window annularly enveloping the cavity.

4,178,079

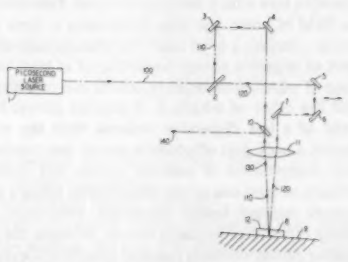
SUB-PICOSECOND OPTICAL GATING BY DEGENERATE FOUR-WAVE MIXING

Gary C. Bjorklund, West Windsor; David M. Bloom, Holmdel, and Paul F. Liao, Fair Haven, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1978, Ser. No. 908,780

Int. Cl.[2] H03F *7/00*

U.S. Cl. 350—353 **18 Claims**



1. An optical gate for producing an output beam in response to two input beams, one of said two input beams having information to be gated, and the other one of said two input beams having gating pulses at the instants when gating is to be per-

formed, said gating pulses having a width which is less than or equal to a picosecond, said optical gate comprising,

a medium having a reflecting surface on one side thereof and a third order nonlinearity in susceptibility,

means for directing and focusing said two input beams to intersect at the interface between said medium and said reflecting surface, said reflecting surface being oriented such that said input beam having gating pulses impinges thereon at substantially a right angle and said input beam having information to be gated impinges thereon at an angle other than a right angle, and

means positioned in the path of the other one of said input beams to separate an output beam that is generated within said medium.

4,178,080

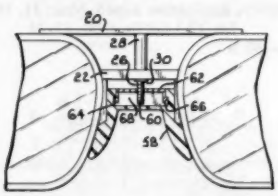
ADJUSTABLE NOSE PIECE ASSEMBLY FOR EYEGLASSES

Eugene E. Elder, 121 Belmont, Hebron, Nebr. 68370

Filed Aug. 30, 1977, Ser. No. 828,988

Int. Cl.[2] G02C *5/12, 5/04, 1/00*

U.S. Cl. 351—137 **6 Claims**



1. A nose piece assembly for use in combination with an eyeglasses frame having a first eyeglass lens and a second eyeglass lens secured to each other by means of a rigid cross piece, said nose piece assembly comprising:

a nose piece for supporting said eyeglasses frame upon the nose, said nose piece having an arched bridge portion with an internally threaded aperture defined in the upper surface thereof and a pair of coplanar leg portions arranged such that one leg portion extends outward from the bottom surface of said bridge portion at each end thereof;

a single continuous mounting channel defined in said cross piece;

a threaded mounting pin having a threaded end portion, said mounting pin being arranged to pass through said mounting channel such that said pin is freely rotatable therein and to threadably engage the internally threaded aperture in said nose piece so that said nose piece is threadably movable along the threaded end portion of said mounting pin; and

guideway means for aligning and securing said nose piece in place with respect to said eyeglasses frame.

4,178,081

SPECTACLES HINGE

Richard T. Metcalfe, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jun. 10, 1977, Ser. No. 805,268

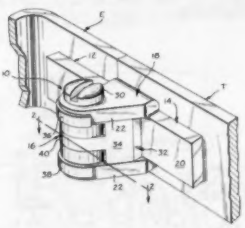
Int. Cl.[2] G02C *5/22, 5/14*

U.S. Cl. 351—153 **9 Claims**

6. A spectacles frame hinge half comprising:

a main supporting body including the integral structure of a plate for securing the hinge half to a spectacles frame and an ear extending laterally from each of two opposite edges of said plate adjacent one end thereof, said ears providing barrel leaves of said hinge half and being coaxially apertured for receiving a hinge screw;

an insert between said ears of said main body, said insert including a portion covering each of facing surfaces of said two ears with space therebetween for receiving a number of barrel leaves of a separate second hinge half, said insert including an integral additional ear between said surface covering portions, said additional ear providing a third barrel leaf of said first mentioned hinge half; and



means on each of said surface covering portions of said insert for preventing its accidental displacement from said main supporting body.

4,178,082

HARDENED CIRCULAR SPECTACLE-LENS ELEMENT AND METHOD OF MAKING THE SAME

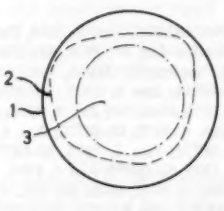
Bernhard Glinswein; Erwin J. Daniels, both of Aalen; Herman Schürle, Oberkochen, all of Fed. Rep. of Germany, and Klaus Grosskopf, Petersburg, Va., assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,538

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657459

Int. Cl.[2] G02C *7/02;* **C03C** *15/00;* **B24B** *1/00*

U.S. Cl. 351—159 **11 Claims**



1. A hardened lens blank adapted for later edging to the profile needed for mounting in a selected one of a variety of spectacle frames, said blank being circular and having optically finished front and back surfaces, both of said surfaces being locally hardened in opposed central regions to the exclusion of opposed surrounding annular regions, said outer regions being of such effective radial extent as to include the requisite profile for each of the different spectacle frames within said variety.

4,178,083

CAMERA CONTAINING A MOVABLE AUTOMATIC DIMMER STROBO

Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 956,974

Claims priority, application Japan, Dec. 26, 1975, 50-176660[U]

Int. Cl.[2] G03B *7/00, 15/03*

U.S. Cl. 354—41 **11 Claims**

1. In a camera:

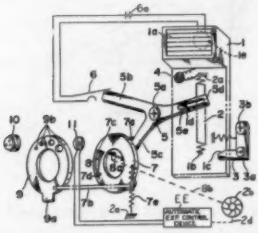
an adjustable iris;

an automatic dimmer strobo selectively movable with re-

spect to said camera between an ordinary photographing position and a flash photographing position;

an adjustable film sensitivity changing ring;

and means responsive to strobo position for transmitting film sensitivity information from said film sensitivity changing ring to said iris when said strobo is in either position, said means comprising:



means including an automatic exposure device responsive to the position of said film sensitivity changing ring to adjust said iris when said strobo is in said ordinary photographing position;

and mechanical means connected between said film sensitivity changing ring and said iris to mechanically adjust said iris when said strobo is in said flash photographing position to a predetermined position determined by the film sensitivity information.

4,178,084

DEVICE FOR MEASURING LIGHT INCIDENT ON AN IMAGE FORMING OPTICAL SYSTEM

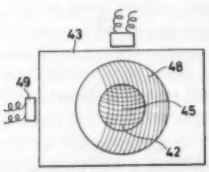
Kazuya Matsumoto, Yokohama; Susumu Matsumura; Aiichiro Koyama, both of Kawasaki; Youichi Okuno, Yokohama; Tokuichi Tsunikawa, Yokohama, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 691,628, Jun. 1, 1976, Pat. No. 4,103,153. This application Jan. 16, 1978, Ser. No. 869,447

Claims priority, application Japan, Jun. 6, 1975, 50-68765; Jun. 6, 1975, 50-68766; Jun. 6, 1975, 50-68767; Jun. 6, 1975, 50-68768; Jun. 6, 1975, 50-68769; Jun. 6, 1975, 50-68770; Jun. 6, 1975, 50-68771; Jun. 6, 1975, 50-68772; Jun. 6, 1975, 50-68773; Jun. 6, 1975, 50-68774; Jun. 6, 1975, 50-68775; Jun. 6, 1975, 50-68776; Jun. 6, 1975, 50-68777; Jun. 6, 1975, 50-68778; Jun. 6, 1975, 50-68779; Jun. 6, 1975, 50-68780; Jun. 6, 1975, 50-68781; Jun. 6, 1975, 50-68782; Jun. 6, 1975, 50-68783

Int. Cl.[2] G03B *7/00, 19/12*

U.S. Cl. 354—59 **17 Claims**



1. A camera, comprising:

an objective lens forming an optical path;

exposure controlling means for controlling exposure;

a finder optical system forming a second optical path;

a plurality of diffraction lattice elements, each of which having predetermined size and arranged in one of the optical paths and substantially overlapping each other at least partially with respect to an image forming light entering these areas; and

photo detecting means for detecting diffraction light from said diffraction lattice elements.

4,178,085

PHOTOGRAPHIC CAMERA WITH A RELEASE LOCKING DEVICE

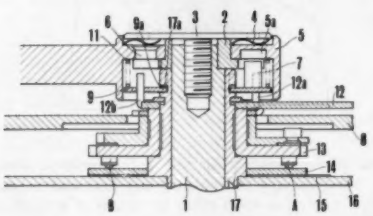
Masayuki Suzuki, Kawasaki; Tadashi Ito, Yokohama; Masayoshi Yamamichi, Kawasaki, and Hiroyasu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,018

Claims priority, application Japan, Mar. 31, 1976, 51/35739

Int. Cl.[2] G03B *7/08, 17/38*

U.S. Cl. 354—60 R **3 Claims**



1. In a camera of a type having a power source, a shutter, a shutter releasebutton coupled to the shutter, first and second switches, an electromagnetic shutter release device which initiates shutter operation and is connected to the power source through the first switch which closes in response to depression of a shutter release button, a photometric circuit which is connected to the power source through the second switch, a photographic information display circuit which displays an output of the photometric circuit, and a wind-up lever with a preparatory angle between its initial stowed position and its advancing position, a releasable locking device comprising:

a release lock switch connected between the power source and the first and second switches for disabling said electromagnetic release device and said photometric circuit as well as said photographing information display circuits when the release lock switch is off;

an operation member concentrically rotatable relative to said wind-up lever for opening and closing said release lock switch in dependence upon the rotary position of the operation member;

connecting means rotatable by said operation member and engagable with the lever when the operation member has opened the release lock switch, said connecting means when engaging the lever being shifted during rotation of the lever from the stowed to the advancing position between a position in which it engages said wind-up lever and another position in which it is disengaged from the wind-up lever,

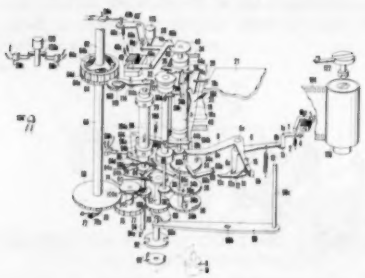
said operation member being moved by movement of said connecting means to the other position when said connecting means engages the lever to close said release lock switch and effect release from a locked condition.

4,178,086

CAMERA WITH A DEVICE FOR PROTECTING FILM AGAINST FOGGING

Nobuaki Date; Hiroshi Aizawa, both of Kawasaki; Masanori Uchidoi, Yokohama; Masami Shimizu, Tokyo, and Yoshiyuki Takishima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,421
Claims priority, application Japan, Apr. 8, 1977, 52-40013
Int. Cl.[2] G03B *19/12, 1/18, 9/08*
U.S. Cl. 354—152 26 Claims



1. A safety device for a camera comprising:

(a) a camera body having a shutter including a front curtain and a rear curtain for controlling the amount of exposure of a film;

(b) shutter time control means for producing a shutter rear curtain closing signal to control the time of closure of the shutter based on a set shutter time or a computed shutter time;

(c) shutter rear curtain holding and releasing means having an electromagnetic device whose energization is controlled by said shutter rear curtain closing signal, for holding or releasing said shutter rear curtain in response to an attracting or releasing operation of said electromagnetic device;

(d) shutter rear curtain movement detecting means for detecting whether said shutter rear curtain runs down to produce a detection signal when said rear shutter curtain runs down;

(e) film winding means for winding the film and having an operating member accessible from outside the camera and a film take-up reel on which the film is wound, said take-up reel being connected to be driven by operation of said operating member;

(f) hindering means for hindering film winding operation and having a detent member engageable with said film winding means and said shutter rear curtain movement detecting means, and arranged so that when said shutter is cocked said detent member engages said film winding means to hinder the film winding up operation and when said shutter rear curtain movement detecting means produces said detection signal, said film winding means is disengaged from said detent member; and

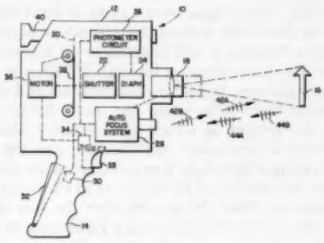
(g) film winding detention release means having an operating member accessible from the outside of the camera for actuating said shutter rear curtain holding and releasing means, so that said rear curtain is released from the held position by operation of said operating member and said film winding means is released from said detent member by the detection signal of said shutter rear curtain movement detecting means.

4,178,087

AUTOFOCUS MOVIE CAMERA HAVING FOCUS CORRECTION MEANS

Edwin K. Shenk, Westford, and Shirley Y. Tam, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1978, Ser. No. 947,774
Int. Cl.[2] G03B *3/10*
U.S. Cl. 354—195 12 Claims



1. In an autofocusing camera having a displaceable lens, means for determining subject distance,

control means energizeable for displacing said lens to a location selected in accordance with said distance determining means to thereby focus an image of the subject on the camera focal plane,

said control means including encoder means responsive to lens displacement for producing a plurality of discrete signals, each representative of displacement of said lens to within a respective positional zone of said lens, and

said control means including means for terminating displacement of said lens when a predetermined signal is produced corresponding to location of said lens within a positional zone selected in accordance with said distance determining means, the improvement comprising:

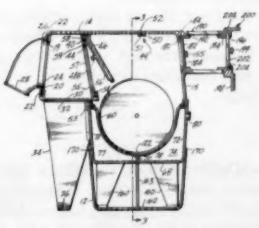
that said displacement terminating means includes means responsive to said predetermined signal for terminating displacement of said lens following production of said predetermined signal at a lens location one-third to one-half the width of said positional zone whereby said lens is arrested close to the center of said positional zone regardless of the direction of lens travel into said positional zone.

4,178,088

PHOTOGRAPHIC PROCESSOR

Herbert D. Harding, 7900 Viscount St., El Paso, Tex. 79926

Filed Jul. 3, 1978, Ser. No. 921,332
Int. Cl.[2] G03D *3/02*
U.S. Cl. 354—308 9 Claims



1. Apparatus for processing photographic film comprising a box open at the top for holding processing equipment, the box having front and back walls, a removable cover mounted on the open top, the cover having front and rear walls spaced substantially farther apart than the front and back walls of the box, the cover including a wide shelf portion extending hori-

zontally from an inner margin at the front wall of the box to the front wall of the cover to close off the gap resulting from the wider spacing of the front and rear walls of the cover relative to the front and back walls of the box, the cover having an inner light-tight partition extending between the inner margin of the shelf and the top of the cover to form an outer compartment, with the shelf forming the bottom wall of the outer compartment, a door in the partition hinged at the top to permit the door to swing open inwardly and up against the top of the cover and to drop under the action of gravity to a closed position, the front of the cover having a pair of openings for access to the outer compartment, a pair of short flexible sleeves secured to the cover around the respective access openings, each sleeve forming a cuff adapted to fit the wrist of a user when the hands are inserted through the sleeves and into the outer compartment, the outer compartment and shelf forming a light-tight work area when the user's hands are inserted through the sleeves, in which light-sensitive film can be unloaded from its container, the partition and the door when closed forming a light-tight barrier between the outer compartment and the interior of the box so as to allow the hands to be safely removed from the sleeves after the film is transferred through the door to the processing equipment in the box.

4,178,089

PHOTOGRAPHIC DEVELOPER

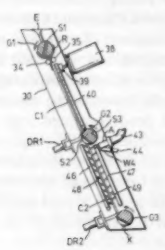
Harry A. H. Spence-Bate, 1 Cheam Pl., Morley, Western Australia, Australia (6062)

Filed Dec. 29, 1977, Ser. No. 865,595

Claims priority, application United Kingdom, Dec. 30, 1976, 54345/76; Mar. 23, 1977, 12278/77; Apr. 19, 1977, 16273/77

Int. Cl.[2] G03D *3/04*

U.S. Cl. 354—319 **8 Claims**



1. A photographic developer comprising in combination:
a first film receiving chamber,
a second film receiving chamber in intercommunication with said first chamber,
a fluid seal separating said chambers,
a first chamber inlet seal,
a second chamber outlet seal,
wherein at least one of said seals comprises a rotatable gate formed as a cylinder with a longitudinal cut away section forming a passage through which film may be passed and wherein said chambers have fluid inlets for feeding fluids therethrough.

4,178,090

3-DIMENSIONAL CAMERA DEVICE

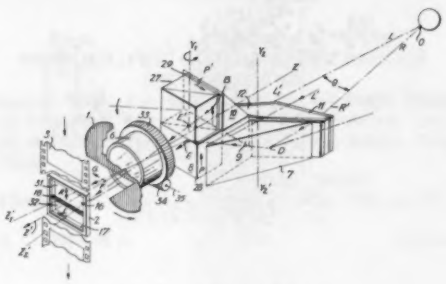
Alvin M. Marks, 166-35 9th Ave., Whitestone, and Mortimer Marks, 166-25 Cryders La., Beechhurst, both of N.Y. 11357

Continuation-in-part of Ser. No. 516,676, Oct. 21, 1974, Pat. No. 3,990,087. This application Jun. 30, 1977, Ser. No. 811,543

Int. Cl.[2] G03B *35/08*

U.S. Cl. 354—117 **28 Claims**

1. In a 3-dimensional camera device for photographing an object space in 3 dimensions from a first and a second position separated by an interocular distance, first and second light ray bundles from said object space to said first and second positions, a monocular lens, a first optical axis and a second optical axis through said lens, a film gate, a film frame at said film gate, a first position first horizontal deflector, and a first position second horizontal deflector, to deflect the said first light ray bundle from the said first position to along said first optical axis, a second position first vertical deflector and a second position second vertical deflector to deflect the second light ray bundle from said second position to along said second optical axis, a dark bar dividing said film gate into a first area coinciding with the plane of the image of the object space carried by the first light ray bundle and a second area coinciding with the plane of the image of the object space carried by the second light ray bundle, said first area and said second



areas being adjacent at the said film gate, said first optical axis passing through center of said first area and the optical center of said lens, and said second optical axis passing through the center of the said second area and the optical center of said lens, means located along said first and second light ray bundles, said means and said dark bar mask defining and separating the said first and second light ray bundles at the first and second areas of said film gate, said first light ray bundle being transmitted only to said first area, and said second light ray bundle being transmitted only to said second area, and in which at least one of said horizontal deflecto·s is rotable, the said second horizontal deflector having a transparent diagonal upper half plane and a specular reflecting lower half plane.

4,178,091

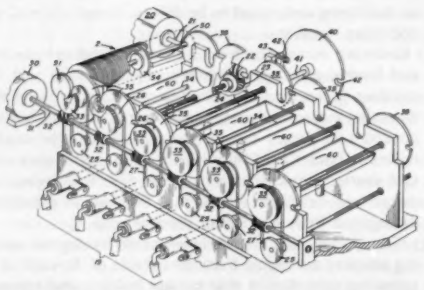
HORIZONTAL FILM PROCESSING APPARATUS

Victor C. Solomon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 774,718, Mar. 7, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,756

Int. Cl.[2] G03D *3/02, 3/08*

U.S. Cl. 354—322 **24 Claims**



1. Apparatus for processing in a photographic processing solution a plurality of similar, disc-shaped film elements supported on a shaft passing through central sections of the elements; each such element having a peripheral edge and including an annular imaging area extending radially inwardly for a

predetermined distance from the edge to the central section; said apparatus comprising:

a housing having a chamber for processing solution, said chamber having an elongate transversely concave bottom surface and adapted to be filled with the processing solution to a depth not substantially exceeding said radial distance;

means for supporting the shaft relative to said housing with the shaft extending in the direction of elongation of said bottom surface and with the edges of the film elements in close proximity to said bottom surface, whereby only the annular area of each film element is contacted by the processing solution; and

means for rotating the elements on the longitudinal axis of the shaft to move the annular area of each element through the processing solution.

4,178,092

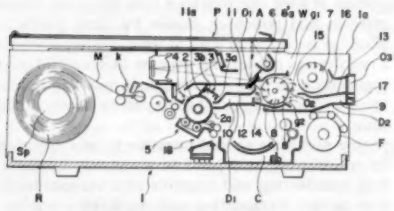
ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH GAS EVACUATING MEANS

Shunji Yamamoto, Shinshiro; Koji Imaizumi, and Takashi Hikosaka, both of Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 631,463, Nov. 12, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,831

Int. Cl.[2] G03G *15/00;* **F23J** *11/00*

U.S. Cl. 355—3 R **4 Claims**



1. An electrophotographic copying apparatus which comprises a rotatable photoreceptor member having a photoconductive surface for repeated formation of an electrostatic latent image of an original thereon, means disposed around said photoreceptor member and including corona charger means for uniformly charging said surface, exposure means for exposing said charged surface to image light of the original through an optical assembly including an illuminating light source so as to form the electrostatic latent image of the original thereon, and means for eliminating harmful gases generated by said corona charger means disposed within the copying apparatus, said means having suction means for drawing away said harmful gases adjacent to the corona charger means and said surface, said suction means including first duct means having one opening adjacent to said corona charger means, and suction fan means connected with said first duct means for generating air flow in the first duct means for drawing said harmful gases generated within said corona charger means through said opening of the first duct means and toward said suction fan, and means for supplying fresh air free from harmful gases toward said photoconductive surface opposed to said corona charger means, said fresh air supplying means including second duct means, one end of the second duct means being adjacent to said photoconductive surface opposed to said corona charger means.

4,178,093

OPTOMECHANICAL SCANNING APPARATUS FOR COPYING MACHINE

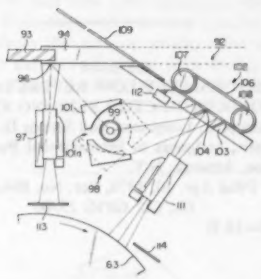
Nobuyuki Yanagawa, and Yasuhiro Tabata, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,144

Claims priority, application Japan, Nov. 27, 1976, 51-142421; Nov. 27, 1976, 51-142422

Int. Cl.[2] G03B *27/00;* **G03G** *15/28;* **G03B** *27/54;* **G03G** *15/32*

U.S. Cl. 355—8 **14 Claims**



1. In an electrostatic copying machine including a rotary photoconductive drum, the combination comprising:

a horizontal platen translatable through a first exposure position;

a sheet document feed means provided at a second exposure position, the second exposure position being located below the first exposure position on a circle concentric with the drum, the document feed means being located below the platen;

first optical focussing means provided between the platen and the drum for focussing a light image from the first exposure position onto the drum; and

second optical focussing means provided between the sheet feed means and the drum for focussing a light image from the second expsoure position onto the drum circumferentially spaced from the light image focussed on the drum by the first optical focussing means.

4,178,094

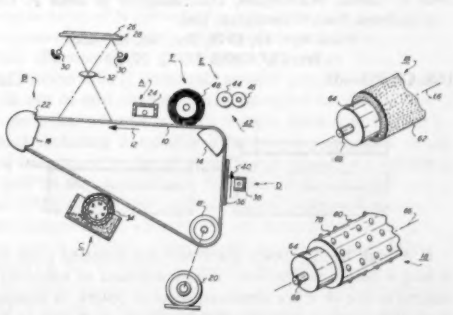
BELT SUPPORT AND STEERING MODULE

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 1, 1978, Ser. No. 939,158

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—16 **16 Claims**



1. An apparatus for controlling the lateral movement of a belt arranged to move in a pre-determined path, including:

means for moving the belt in the pre-determined path, said

moving means having a readily deformable surface in contact with the belt;

means for supporting the belt and opposing the lateral movement of the belt from the pre-determined path, said supporting means causing the belt to distort the surface of said moving means so that the belt returns to the predetermined path; and

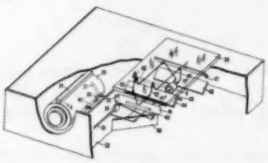
means for supplying a pressurized fluid between said supporting means and the belt to at least partially support the belt and reduce friction between the belt and said supporting means.

4,178,095

ABNORMALLY LOW REFLECTANCE PHOTOCONDUCTOR SENSING SYSTEM

James R. Champion, Longmont, and Steven D. Seigal, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,957
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 R **3 Claims**



3. Copier control apparatus comprising:

a photoconductor;

means operable to establish a discharged test area and a charged test area, both test areas within the area of said photoconductor normally used for document reproduction;

a developer operable to present toner to said charged test area to thereby normally tone said charged test area;

light reflectance sensing means operable to compare light reflected from said discharged test area to that reflected from said charged test area, to thereby provide an output signal indicative of the quality of the test area; and

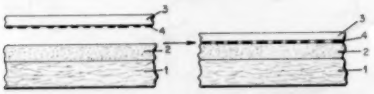
means including said light reflectance means operable to sense abnormally low light reflectance from said discharged area, to thereby provide an output signal indicative of abnormally dark photoconductor.

4,178,096

HIGH FIDELITY COLOR PRINTS

John F. Lontz, Wilmington, Del., assignor to John F. Lontz Associates, Inc., Wilmington, Del.

Filed Apr. 10, 1978, Ser. No. 887,436
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—32 **4 Claims**



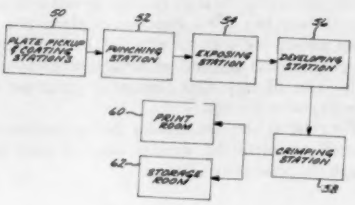
1. A high fidelity color corrected and adjusted print comprising a base reproduction initially deficient or rendered excessive in one or more measured spectral colors, as compared to their measured natural color rendition, with one or more overlays of laminated adherent dyed polymeric films serving to provide the color correction and adjustment with selected intensities of additive and subtractive primary colors.

4,178,097

AUTOMATIC LITHOGRAPHIC PLATE PROCESSOR

George M. Sara, Garden Grove, Calif., assignor to Beach Manufacturing Corporation, Huntington Beach, Calif.

Filed Sep. 6, 1977, Ser. No. 830,820
Int. Cl.[2] G03B *27/30*
U.S. Cl. 355—100 **19 Claims**



1. A method of automatically producing finished lithographic plates from a supply of blank plates and a supply of negatives, comprising the steps of:

picking up a blank plate from said supply of blank plates in a pickup station and placing said plate on a coating conveyor to a coating station;

coating the underside of said blank plate with a photosensitive fluid in said coating station and then inverting said plate and placing it on a first stage drying conveyor;

drying said fluid on said plate in a two-stage drying station by passing said plate through a heated air baffle in a first direction on said first stage drying conveyor on a first level and then moving said plate to a second lower level and placing it on a second stage drying conveyor moving in a second direction opposite to said first direction through said heated air baffle and thereafter conveying said plate to a punching station;

punching at least one indexing hole along the edges of said plate in said punching station by, first, positioning said plate for registration with at least one negative carried by a registration carrier and vacuum locking said plate to said registration carrier, punching said indexing hole and then transporting said registration carrier to an exposing station;

exposing said plate to said negative in said exposing station by transferring said plate to a vacuum locked exposure bed, transferring said negative to a vacuum locked negative carrier, transporting said registration carrier back to said punching station, vacuum locking said plate with said negative, exposing said plate, disengaging said negative from said exposed plate and placing said plate on a developing conveyor to a developing station;

developing said exposed plate in said developing station and placing said developed plate on a crimping conveyor to a crimping station; and

crimping said edges of said plate having said indexing holes in said crimping station by positioning said plate on a crimping bed, vacuum locking said plate on said crimping bed, crimping said edges of said plate, releasing said vacuum lock on said plate and conveying said finished plate to an exit station.

4,178,098

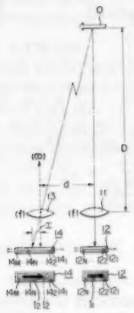
RANGE DETECTING METHOD AND APPARATUS

Noriyuki Asano, Kawasaki; Yukichi Niwa, Yokohama; Mitsutoshi Owada, Yokohama; Takaaki Yamagata, Yokohama, and Shin Tsuda, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,343
Claims priority, application Japan, Jan. 6, 1977, 52-506
Int. Cl.[2] G01C *3/00;* **G03B** *7/08*
U.S. Cl. 356—1 **23 Claims**

1. A method of detecting a range of an object comprising the steps of:

(A) deriving first and second images of the object along different sightlines;
(B) electrically sensing the first and second images to produce electrical analog data for each image element of the first and second images;
(C) storing the analog data of the first image on a first set of a plurality of N successive elements;
(D) successively correlating the analog data of said second image on each of a plurality of different sets of N successive elements with the analog data of said first image on the N successive elements, said correlating step including successively storing, on one set by set basis, the analog data on each of said plurality of sets of the N successive elements of the second image;



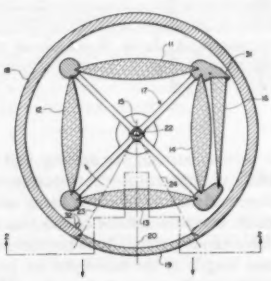
(E) successively storing the location, of each of the plurality of sets of the N successive elements of the second image whose analog data is correlated with the analog data on the N successive elements of the first image;
(F) detecting, through said correlation step, a set of the N successive elements of the second image which can be regarded as being in substantial coincidence with the N successive elements of the first image; and
(G) determining the range of the object on the basis of the location of the stored data with respect to the location of the second image, of the set of the N successive elements of the second image which has been regarded as being in substantial coincidence with the N successive elements of the first image.

4,178,099

SCANNING OPTICAL SPECTRAL ANALYZER

Lowell F. Williams, West Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 846,646
Int. Cl.[2] G01N *21/00;* G01J *3/06*
U.S. Cl. 356—73 **7 Claims**



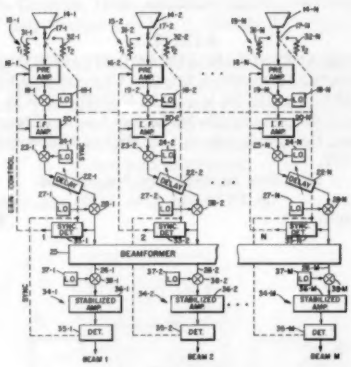
1. Apparatus for scanning a relatively wide field of view and enabling spectral information from a point source of optical radiation in the field to be derived comprising detector means for detecting the radiation; means having a relatively narrow instantaneous field of view for optically scanning the wide field of view to sequentially direct radiation from successively scanned portions of the wide field of view onto the detector means; optical dispersion means for dispersing the radiation; a first optical path for the radiation including the dispersion means, the scanning means and the detector means; and a second optical path for the radiation including the scanning means and the detector means; the dispersion means and the scanning means of said first path causing a convolution of spectral energy from the source on the detector means displaced in time from the spectral energy directed onto the detector through the second optical path during a scan of a wavelength of radiation from the source.

4,178,100

DISTRIBUTED-SWITCH DICKE RADIOMETERS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Curt A. Levis, Columbus, Ohio

Filed Mar. 29, 1978, Ser. No. 891,356
Int. Cl.[2] G01J *1/56;* H04B *17/00*
U.S. Cl. 356—216 **26 Claims**

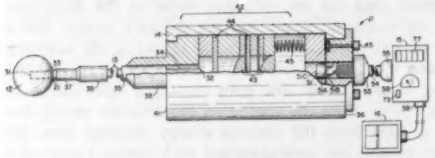


1. A radiometer for deriving high spatial resolution information from terrestrial, atmospheric or outer space regions, comprising an array of N elements for transducing electromagnetic energy into electric signals, all of said elements being simultaneously illuminated by electromagnetic energy from the region, N substantially identical, parallel processing channels, the ith one of said channels being provided for the ith one of said elements, where i is every integer from 1 to N, the ith channel including a variable gain device responsive to the signal transduced by the ith element and means for controlling the gain of the channel as a function of the channel output signal while at least one calibrated noise radiator is connected to the channel input, whereby the ith channel derives an output signal that is a replica of the amplitude and phase of radiation incident on the ith element, means for combining the output signals simultaneously derived from the N channels while each of the elements is simultaneously responsive to the radiation from the region so that the combining means derives a further signal that is a replica of the energy radiated from the region and a vector sum of the energy illuminating all of the elements from the region.

4,178,101
SCALAR IRRADIANCE METER

Charles R. Booth, 4648 Milton St., San Diego, Calif. 92110

Filed Mar. 16, 1977, Ser. No. 778,028
Int. Cl.[2] G01J 1/42; G02B 5/14
U.S. Cl. 356—221 11 Claims

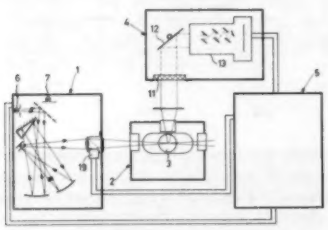


1. An apparatus for measuring the incident flux of scalar irradiance over a 4π solid angle which comprises:
(a) means for collecting omnidirectional scalar irradiance, said collecting means comprising a solid, spherical structure;
(b) means for converting the incident flux of said scalar irradiance into an electrical signal;
(c) means for adjusting the spectral response of the apparatus to obtain a spectral response that will allow said apparatus to measure scalar irradiance in predetermined radiometric or photometric units;
(d) means for conducting said scalar irradiance from substantially the geometrical center of said collecting means to said adjusting means;
(e) means for conditioning said electricai signal for its display; and
(f) means for displaying said electrical signal.

4,178,102
PROCESS AND APPARATUS FOR MEASURING THE CONCENTRATION OF A MOLECULE OF SELECTIVE SPECTRUM IN A SAMPLE SUBSTANCE

Clemente C. Riccardi; Sergio Meda, and Luciano Cigognini, all of Milan, Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,956
Int. Cl.[2] G01J 3/36, 3/30
U.S. Cl. 356—307 8 Claims

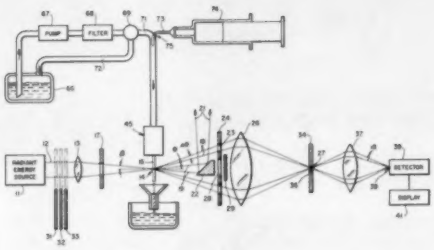


1. A process for measuring the concentration of a molecule of selective spectrum in a sample substance, comprising subjecting the sample substance to a first monochromatic excitation light of wavelength lying within the absorption spectrum of the molecule under measurement, filtering and collecting a first light emission from the sample substance at a wavelength lying within the emission spectrum of the molecule, and determining the intensity of the monochromatic light collected, and further comprising subsequently subjecting the sample substance to a second monochromatic excitation light of a wavelength close to that of the first monochromatic light but outside the absorption and emission spectra of the molecule, filtering and collecting a corresponding second light emission from the sample substance at the same wavelength as the first, then determining the new intensity of collected light and subtracting this from the first to give a useful monochromatic light signal free from spurious signals due to diffused light or to spurious fluorescent or phosphorescent light due to traces of other molecules in the sample substance.

4,178,103
LIGHT SCATTERING PHOTOMETER AND SAMPLE HANDLING SYSTEM THEREFOR

Richard W. Wallace, Los Altos, Calif., assignor to Chromatix, Inc., Mountain View, Calif.

Filed Mar. 28, 1977, Ser. No. 781,740
Int. Cl.[2] G01N 15/02
U.S. Cl. 356—336 10 Claims

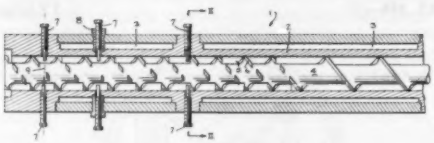


1. A light scattering photometer for measuring radiant power scattered by particles dispersed in a liquid comprising means forming a thin, flat curtain of said liquid having substantially parallel spaced unsupported surfaces, means for radiating a small sample volume of the liquid curtain with a beam of radiant power directed substantially perpendicularly through the curtain from one surface to the other and means for detecting the radiant power scattered by particles in said sample volume.

4,178,104
METHOD AND APPARATUS FOR MIXING VISCOUS MATERIALS

Hans G. L. Menges, Laurensberg b. Aachen; Engelbert G. Harms, Vaalserquartier b. Aachen, and Rainer Hegele, Ehningen, all of Fed. Rep. of Germany, assignors to Uniroyal, AG, Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 641,790, Dec. 18, 1975, abandoned, which is a continuation of Ser. No. 379,537, Jul. 16, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,316
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1972, 2235784
Int. Cl.[2] B29B 1/06
U.S. Cl. 366—80 18 Claims



1. A single screw extruder for mixing and homogenizing viscous materials comprising a screw conveyor for rotation inside a housing, said screw conveyor being an integral member having at least one substantially continuous thread flight of a constant pitch extending helically in the same direction along the longitudinal length of the conveyor for providing a substantially continuous forward feed path of stock material throught the extruder, said flight providing in the feed path direction a first zone for stock material input subsequently followed by a second zone for stock material mixing and ho-

mogenizing; the thread in the first zone having uninterrupted lands and the thread in the second zone having spaces between adjacent lands of the screw thread and interrupting gaps in the lands of the screw thread, obstacle means projecting into at least one of said spaces and gaps for penetrating the stock material as the screw conveyor is substantially limited to rotational movement during the forward feed to create vortexing in the material; there being at least one full revolution of the screw thread between axially adjacent obstacle means, and means for adjusting said obstacle means to achieve desired depths of projection thereof relative to the respective gaps and spaces to accommodate different material to be mixed or different mixing conditions and creating local vortexing in the material during the forward feed thereof, each vortex location and degree of vortexing thereat being determined by the adjusted depth of the respective obstacle means.

4,178,105

APPARATUS FOR CONTROLLING THE TEMPERATURE OF FLOWABLE CHOCOLATE MATERIALS

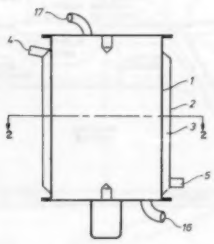
Helmut Sollich, Kalletal, Fed. Rep. of Germany, assignor to Sollich KG Spezialmaschinenfabrik, Bad Salzuflen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,852

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725183

Int. Cl.[2] B01F *7/16;* A23C *3/04*

U.S. Cl. 366—312 **6 Claims**



1. An arrangement for treating chocolate material comprising, a cylindrical container for axially conveying the chocolate material therethrough, a rotationally symmetrical cylindrical rotor mounted in said container with its axis extending parallel to the longitudinal axis of the container but mounted eccentrically relative thereto, said rotor including obliquely, outwardly-directed slots along its periphery extending substantially along its entire length, with bar wiper members arranged in said slots and extending along substantially the entire length thereof, said bar wiper members having sharpened outer edges, means for supporting said bar wiper members with their sharpened outer edges forcibly bearing against the inner wall of the cylindrical container including springs arranged between the bar wiper members and the slots in the rotor, and said cylindrical container having an inlet for chocolate material at one end in the region of the maximum distance between the rotor and the cylindrical container, and an outlet for chocolate material at its other end in the region of the mimimum distance between the rotor and the cylindrical container.

4,178,106

PRINT GAP ADJUST MECHANISM FOR PRINTERS

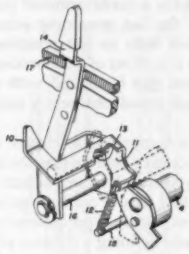
Werner H. Mailer, and Charles E. Milliser, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Nov. 25, 1977, Ser. No. 855,007

Int. Cl.[2] B41J *3/04*

U.S. Cl. 400—57 **6 Claims**

1. In a printer wherein it is desired to move the print head away from a predetermined gap spacing with respect to a print surface for servicing and for resetting the print head to said predetermined gap spacing comprising, means for moving said print head away from said surface comprising a lever for rotating said print head eccentrically about an axis, said means for resetting said print head comprising a movable arm pivoted for movement in fixed distance increments about a pivot point, a cam follower provided on one of said arm and lever, said other



of said arm and lever comprising a cam face for mating with said cam follower, the cam face and its location with respect to the center of said axis being dimensioned such that moving the movable arm through successive increments of distance causes the print head to be moved correspondingly fixed distance increments of distance with respect to said surface.

4,178,107

TYPING DEVICE

Giampaolo Guerrini, Ivrea, and Dario Bisone, Montalto Dora, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

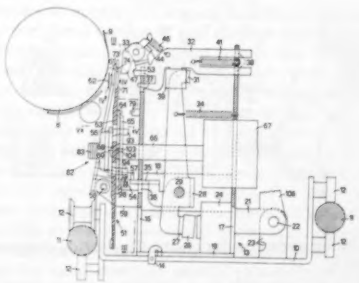
Continuation of Ser. No. 709,126, Jul. 27, 1976, abandoned, which is a division of Ser. No. 475,122, May 31, 1974, Pat. No. 3,983,985. This application May 3, 1977, Ser. No. 793,391

Claims priority, application Italy, Jun. 19, 1973, 68815 A/73

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—144.2 **9 Claims**



1. A typing device comprising:

a sheet-carrying platen defining a printing line and a typing point;

a character-bearing disk comprising a plurality of laminae each carrying a type character and terminating in a free end on the periphery of said disk;

means defining a gap in the outermost periphery of said disk;

input means for serially entering characters to be printed;

type character selecting means responsive to a character entered by said input means for rotating said disk and arresting the same so as to align a selected one of said laminae in front of said typing point, such rotation of said disk beginning from a rest variable position defined by the

position reached by said disk upon printing the next preceding selected character;

striking means for impacting the selected lamina to type the selected character, said selecting means maintaining said selected lamina in front of said striking means after the impacting thereof; and

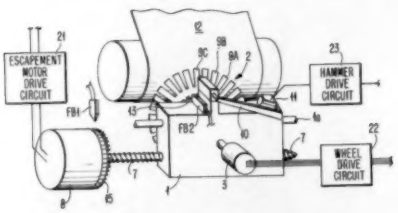
means responsive to the absence of entered characters in said input means within a predetermined period of time after the entering of the last preceding entered character for rotating said disk from its last position wherein the last selected lamina is in front of said striking means to a position wherein said gap is aligned with said typing point, whereby the last typed characters can be seen through said gap.

5. A typing device comprising a selector shaft, a character-bearing disk constructed of flexible plastics material and means for removably fixing said disk to said selector shaft, said selector shaft having a shaft axis, a conical end and flange means, extending radially outwardly a predetermined radial distance from said shaft axis and defining a rotation plane perpendicular to said shaft axis, wherein the character-bearing disk includes a plurality of laminae, a central part and a conical seat, cooperative, respectively, with said flange means and said conical end for aligning said laminae in a plane parallel to said rotation plane, wherein said shaft and said disk each comprises attachment portions radially spaced from said shaft axis a distance less than said predetermined radial distance; and wherein said fixing means comprise a hooked element engageable with the attachment portions at said shaft and said disk for fixing the disk to the selector shaft by making said central part adhere to said flange means and said conical seat adhere to said conical end taking up any possible play therebetween, said hooked element being releasable from said attachment portions for the removing of said disk from said selector shaft.

4,178,108
APPARATUS FOR SPACE SYNCHRONIZING CARRIER AND ROTATABLE PRINT DISK POSITIONS IN ON-THE-FLY PRINTING

Milburn H. Kane, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1978, Ser. No. 918,998
Int. Cl.[2] B41J *1/26*
U.S. Cl. 400—144.2 **11 Claims**



1. A printing apparatus for on-the-fly printing comprising in combination:

carrier means movable at a variable velocity from a first print position past a second print position on a printing medium,

printing means comprising a plurality of movable characters, each engagable with said printing medium,

character selection means for moving said characters over a variable distance, during the movement of said carrier means, from a first selected character coincident with said carrier at said first print position to a second selected character coincident with said carrier at said second print position,

means for urging said characters into engagement with said printing medium, and

printing control means for controlling the movement of said carrier means and selection means into said coincidence at said second printing position and for actuating said urging means when said coincidence occurs,

said control means including

means for detecting a coincidence failure at said second print position,

means responsive to a detected coincidence failure for reversing the movement of said carrier torward said first print position while permitting the continued movement of said selection means toward said second selected character,

means for reinitiating the forward movement of said carrier toward said second print position and

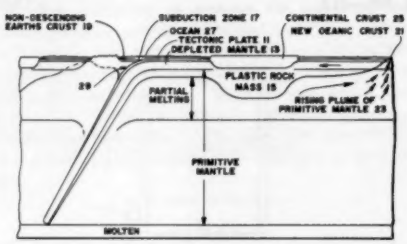
means for retaining the selection means at the second selected character until the arrival of the reinitiated carrier at said second print position,

whereby said coincidence and actuation will occur if the selection means has reached said second character by the time the reinitiated carrier has reached the second print position.

4,178,109
METHOD FOR THE DISPOSAL OF NUCLEAR OR TOXIC WASTE MATERIALS

Robert A. Krutenat, Rte. 1, Box 471, Chimacum, Wash. 98325

Filed Oct. 11, 1977, Ser. No. 840,688
Int. Cl.[2] E21F *17/16;* **G21F** *9/36*
U.S. Cl. 405—128 **11 Claims**



1. The method of disposing of nuclear waste material wherein the earth has several subduction zones and includes a tetonic plate at each of these subduction zones that descends, adjacent a non-descending earth crust, into the central region of the earth comprising the steps of:

(a) drilling at least one borehole into said tectonic plate adjacent the non-descending earth crust;

(b) positioning said nuclear waste material in said bore hole; and

(c) sealing the nuclear waste material in said borehole; whereby

(d) said tectonic plate and said at least one borehole containing said nuclear waste material descend into the central region of the earth.

4,178,110
LINER FOR LARGE DIAMETER BOREHOLE

James H. Cobbs, 5144 S. New Haven, Tulsa, Okla. 74135

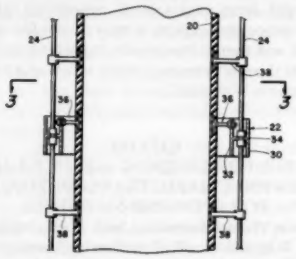
Filed Oct. 3, 1977, Ser. No. 838,745
Int. Cl.[2] E02D *5/00*
U.S. Cl. 405—133 **5 Claims**

1. A liner of low flexural rigidity adapted to be grouted into a borehole drilled in the earth comprising:

a thin-walled cylinder of selected diameter, less than that of said borehole, so that when said cylinder is inserted into said borehole an annular space will be provided between said cylinder and the wall of said borehole for receiving grout therein; and

at least one support ring surrounding said cylinder attached

to said cylinder by means of a plurality of circumferentially spaced keys, each key having its inner ends attached



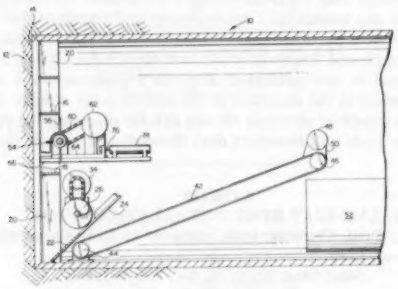
to said cylinder and its outer ends attached to said support ring.

4,178,111

APPARATUS FOR THE EXCAVATION OF SUBTERRANEAN TUNNELS

Fernand Plourde, 111 Westwood Ave., Plainville, Conn. 06062, and Maurice Plourde, 45 Wakeley Rd., Newington, Conn. 06111

Filed Aug. 30, 1978, Ser. No. 938,114
Int. Cl.[2] E21D *9/06*
U.S. Cl. 405—142 **10 Claims**



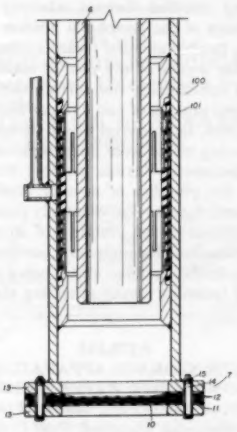
1. In apparatus for the excavation of subterranean tunnels, the combination of a hollow cylindrical shield adapted to be axially forced through the subterranean material and having a circular cutting edge at a leading end portion, an inclined baffle and guide member extending across a lower portion of the shield internally and rearwardly of its cutting edge, the inclination of the member being rearwardly and upwardly with respect to a lower portion of the cutting edge and the lower edge of the member being arcuate to substantially fit the internal parti-circular contour of the shield, and the baffle and guide member having an opening spaced upwardly and rearwardly from its lower edge and approximately intermediate its ends, an auger-like member rotatable about a substantially horizontal axis and disposed internally across the shield rearwardly of its cutting edge and above said baffle and guide member and adjacent the opening in the member, said auger-like member having first and second similar but opposite sections extending on horizontally opposite sides of said baffle opening and with oppositely directed flutes, power means for rotating said auger-like member whereby to cause the member to transport and to direct subterranean material dislodged by said cutting edge horizontally inwardly in opposite directions for downward discharge through said baffle and guide member opening and for further transport and removal rearwardly beneath the baffle and guide member from the interior of the shield.

4,178,112

PLAT-GARD LEG CLOSURE

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 12, 1978, Ser. No. 914,467
Int. Cl.[2] E02D *5/52*
U.S. Cl. 405—227 **8 Claims**



1. In combination, a diaphragm and annular diaphragm retaining means retaining said diaphragm therein, for closing the bore of a tubular support member of a marine platform or similar structure,

said diaphragm comprising:

circular elastomeric flexible member means having a peripheral portion and an inner portion, the upper and lower exterior surfaces of the peripheral portion being substantially parallel to the upper and lower exterior surfaces of the inner portion; the cross-sectional thickness of said circular elastomeric flexible member means being substantially less in comparison than the diameter of said circular elastomeric flexible member means whereby the shape of said circular elastomeric flexible member means substantially comprises a disk;

a plurality of annular reinforcing member means located in the peripheral portion of said circular elastomeric flexible member means, each annular reinforcing member means of said plurality having a substantially rectangular cross-sectional shape with the cross-sectional thickness thereof being substantially less in comparison than the cross-sectional width thereof thereby forming a thin cross-sectional shape and each annular reinforcing member means of said plurality being disposed in the peripheral portion of said circular elastomeric flexible member means having the cross-sectional width thereof in substantially parallel relationship to the cross-sectional width of an adjacent annular reinforcing member means of said plurality and being disposed in substantially parallel relationship to the upper and lower exterior surfaces of the peripheral portion of said circular elastomeric flexible member means; and

reinforcing means having a peripheral portion and an inner portion disposed within said flexible member means, said reinforcing means comprising a plurality of layers of fabric, each layer of fabric of said plurality having the peripheral portion thereof secured to the cross-sectional width of at least one of said annular reinforcing member means whereby each layer of fabric of said plurality is disposed within said circular elastomeric flexible member means in substantially parallel relationship with respect to an adjacent layer of fabric of said plurality; and

said annular diaphragm retaining means comprising:

a pair of annular plate means releasably secured to each other by a plurality of fastening means extending through

the pair of annular reinforcing member means, and through the peripheral portion of said reinforcing means, said annular diaphragm retaining means having one of the pair of annular plate means secured to the bottom of said tubular support member of a marine platform or similar structure thereby closing the bore of said tubular support member by said diaphragm and said diaphragm retaining means being installed thereon whereby the upper and lower surfaces of the peripheral portion of said circular elastomeric flexible member means sealingly engage such annular plate means of the pair of annular plate means throughout substantially one surface thereof by abutting the peripheral portion of said circular elastomeric flexible member means, the removal of the peripheral portion of said reinforcing means from the peripheral portion of said circular elastomeric flexible member means being prevented by the plurality of annular reinforcing member means secured thereto in substantially parallel relationship and the removal of the plurality of annular reinforcing member means from the peripheral portion of said circular elastomeric flexible member means being prevented by the plurality of fastening means extending therethrough.

4,178,113

BUFFER STORAGE APPARATUS FOR SEMICONDUCTOR WAFER PROCESSING

Robert I. Beaver, II, Menlo Park; Michael J. Adams, San Jose; George L. Prodanovich, Campbell; Paul F. Key, San Martin; Don O. Rawlings, San Jose; P. Santhanam, Sunnyvale, and Susan L. Hunt, Milpitas, all of Calif., assignors to Macronetics, Inc., Sunnyvale, Calif.

Filed Dec. 5, 1977, Ser. No. 857,427
Int. Cl.² B65G *51/02*
U.S. Cl. 406—10 **23 Claims**

1. In a semiconductor wafer processing system having a plurality of processing stations spaced along a conveyor structure and in which the various processing stations may process wafers at different rates and in which each said processing station provides signals indicating its availability or unavailability for processing a wafer, buffer storage apparatus cooperating with three such processing stations, said buffer storage apparatus comprising

a first buffer storage station positioned along said conveyor structure between a first and a second said processing stations and a second buffer storage station positioned along said conveyor structure between said second processing station and a third processing station,

said first buffer storage station comprising

first means for receiving and temporarily holding a first wafer group comprising a predetermined number of said wafers received from said first processing station and then supplying wafers from said first wafer group to said second processing station and thence to said second buffer storage station, and

means for conveying a wafer received at said first buffer storage station to said first holding means and from said first holding means toward said second processing station; and

second means for temporarily holding any additional wafers received from said first processing station during the time that said first receiving and holding means is holding or supplying to said second processing station wafers from said first wafer group; and

said second buffer station comprising

means for conveying a wafer received from said second processing station through said second buffer station to said third processing station if said third processing station is available for receiving said wafer, and

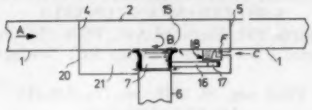
means for receiving and temporarily holding said wafer received from said second processing station if said third processing station is unavailable for receiving said wafer and then subsequently supplying said held wafer to said third processing station when said third processing station is available.

4,178,114

APPARATUS FOR DIVIDING A FLOCK-LADEN AIR STREAM IN PNEUMATIC TRANSPORTING SYSTEMS FOR SPINNING MACHINES

Robert Amann; Werner Lattmann, both of Ohringen, and Rudolf Wildbolz, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 1, 1978, Ser. No. 901,485
Claims priority, application Switzerland, Apr. 29, 1977, 5336/77
Int. Cl.² B65G *53/40*
U.S. Cl. 406—155 **21 Claims**



1. In combination

a transport duct for transporting a flock-laden air stream,

at least one branch duct connected to said transport duct to receive a part-flow of a flock-laden air stream passing through said transport duct, said branch duct being connected to said transport duct on a predetermined axis disposed in the direction of the part-flow air stream; and

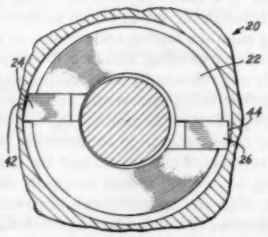
means rotatably mounted on said axis for directing the part-flow from said transport duct through said branch duct.

4,178,115

VALVE SEAT RING INSTALLATION TOOL

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Mar. 30, 1978, Ser. No. 891,693
Int. Cl.² B23C *1/20*
U.S. Cl. 408—82 **8 Claims**



1. A rotatable tool for reaming a counterbore in a workpiece having a bore with a sidewall and a bottom defined therein, said tool being of the type guided by a pilot member secured axially in said bore, said tool comprising, in combination:

a rotatable blade holder having an annular opening, the diameter of the annular opening being substantially equal to the diameter of said pilot member, and an axis defining an axial direction and radial distances, said axial direction being parallel to said axis and said radial distances being measured perpendicularly from said axis, said blade holder being annular about said axis;

a plurality of cutter blades mounted on said blade holder, one of said cutter blades having an axially extending cutting edge at a pre-selected radial distance from said axis, the remainder of said cutter blades each having a non-cutting axial edge at a radial distance less than said pre-selected radial distance, each of said cutter blades also having a radially extending cutting edge, said radially extending cutting edges being substantially equal to each other in length, and aligned in a single radial plane perpendicular to said axis;

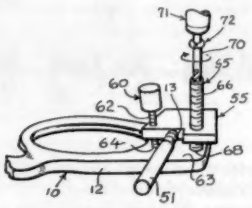
whereby only said one cutter blade with said axially extending cutting edge reams the sidewall of the bore of said workpiece while all cutter blades ream the bottom of the bore, so that said counterbore is reamed rapidly and not enlarged in radius beyond said pre-selected radial distance due to vibration or wear of the mounting of the blade holder on said pilot member.

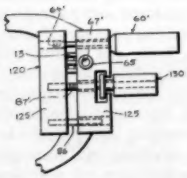
4,178,116

SPECTACLE FRAME WITH ANGULARLY ADJUSTABLE TEMPLES AND MEANS FOR MANUFACTURING AND ASSEMBLING SAME

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Division of Ser. No. 710,788, Aug. 2, 1976, Pat. No. 4,105,305.
This application May 9, 1977, Ser. No. 795,029
Int. Cl.[2] B23B *47/28, 49/02*
U.S. Cl. 408—108 **33 Claims**





25. A template device for facilitating the drilling of a bore by a drill disposed at a selective angle and position relative to an end piece of an eyeglass frame having a temple piece and a hinge thereon oriented relative to said end piece, comprising a plate having a plate bore therethrough with a plate bore axis oriented at a selected axis angle in respect to said plate, a tube having a drill receiving bore therethrough disposed in the plate bore with an end for the exit of the drill which is adapted to extend outwardly from the plate into engagement with the frame, adjustment means for adjusting said tube in the plate bore so as to position it so that the end is engageable against the frame, and clamping means associated with said plate for clamping said plate to said frame to position said plate relative to said hinge.

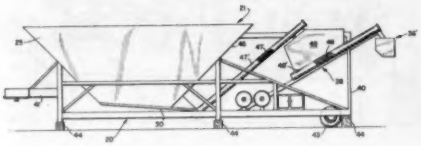
33. A template device for facilitating the drilling of a bore into a surface of a frame of an eyeglass which includes a hinge projecting therefrom, comprising a clamp member engageable with the hinge on said eyeglass frame and having first and second plate portions engageable with said hinge, at least one hollow drill tube extending through said first plate portion, adjustment means for adjusting said drill tube relative to said first plate portion to permit it to move to a position in which it bears against the frame to be drilled, said drill tube having a bore therethrough for the passage of a drill so that the drill is guided right up to the frame surface at which it is to be drilled, and a stabilizer threaded into said first plate portion and being adjustably threaded to bear against said second plate portion for positioning said first and second plates relative to the hinge and for clamping it in an adjusted position.

4,178,117

MOBILE SIDE-BY-SIDE BATCHING PLANT

Richard K. Brugler, Warren, Ohio, assignor to Heltzel Company, Warren, Ohio

Filed Feb. 2, 1978, Ser. No. 874,620
Int. Cl.[2] B65G *67/08*
U.S. Cl. 414—21 **3 Claims**



1. A mobile side-by-side pre-erected batching plant having transport wheels at one end thereof for the proportioning of materials for the production of concrete, whereby said pre-erected batching plant at the job site requires only blocking and leveling of the main frame to position the structure for the discharge of aggregates and cement at a truck charging elevation, said plant comprising a longitudinally substantially rectangular supporting main frame; a substantially rectangular unitary receptacle fixedly mounted thereon and provided with separating partitions therein, said partitions comprising a longitudinal wall dividing the receptacle substantially in half and a plurality of transverse walls extending substantially perpendicularly from said longitudinal wall to a wall of said receptacle on one side thereof, thereby providing a plurality of aggregate receiving bins in one-half of said receptacle and a cement receiving bin in other half; means controlling the discharge of material from each of said bins, said means being disposed adjacent the lower portion of each bin; aggregate weighing means positioned beneath said means for controlling the discharge of material from each of said bins, a first longitudinally extending transport conveyor means mounted on said weighing means and disposed in receiving relation to said aggregate weighing means, a second longitudinally extending transport conveyor means pre-erected to receive aggregates from said first longitudinally extending transport conveyor means and to discharge aggregates at said truck charging elevation; and a first longitudinally extending cement transport conveyor means mounted in an inclined pre-erected condition to receive cement from said cement bin at its lower end, cement weighing means positioned to receive cement from said first cement conveyor and a second longitudinally extending cement conveyor transport means receiving cement from said cement weighing means to discharge cement at said truck charging elevation.

4,178,118

BUNDLE SQUARING MACHINE

Peter E. Bailey, 96 Broadwater Dr., Saratoga, Australia

Filed Dec. 7, 1977, Ser. No. 858,239
Claims priority, application Australia, Dec. 14, 1976, 8486/76
Int. Cl.[2] B65G *47/26*
U.S. Cl. 414—28 **10 Claims**

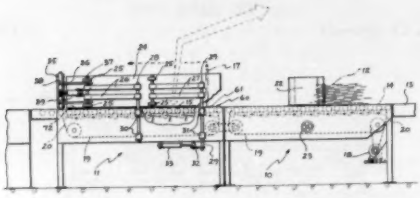
1. A bundle squaring machine comprising:

(a) a horizontally disposed conveyor system for conveying a bundle of articles in a longitudinal direction into and from a squaring zone of the machine,

(b) a pair of parallel spaced-apart vertically disposed side

squaring arms located above the conveyor system, the squaring arms being actuable to move toward one another in a lateral direction, whilst maintaining their parallel relationship, to co-act against a bundle of articles when located therebetween, and the squaring arms defining side borders of the squaring zone,

(c) pusher means normally located in a retracted position below the level of the conveyor system intermediate the squaring arms, the pusher means being actuable to project upwardly above the level of the conveyor system and then to move in the longitudinal direction of the machine to push against a trailing end of a bundle of articles when located within the squaring zone,



(d) vertically disposed rollers pivotably mounted one to each of the squaring arms at the leading end thereof, the rollers being spring biased to normally locate within side borders of the squaring zone to engage with a leading end of a bundle of articles when located within the squaring zone and when pushed longitudinally forward by the pusher means,

(e) means actuable to cause the vertically disposed rollers to pivot away from their normal position and to a position outside of the side borders of the squaring zone following a period of contact between the vertically disposed rollers and a bundle when located within the squaring zone, and,

(f) means actuable to halt movement of the conveyor system during actuation of the squaring arms and the pusher means.

4,178,119

ARRANGEMENT FOR TURNING, MULTIPLE STACKING AND ALIGNING A PAPER STACK

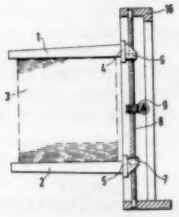
Gerhard Busch, Heidenkampsweg 48, 2000 Hamburg 1, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,651

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 7715854[U]; May 25, 1977, 2723496

Int. Cl.[2] **B65H** *31/40*

U.S. Cl. 414—28 **9 Claims**



1. A device for turning and multiple placing on top of each other and for the alignment of paper stacks which are located on the rear contact plate of a turning stacker in a position preferably turned by 90°, comprising: fork-shaped members placed between individual paper stacks and being adjusted at a carrying plate of the stacker; means for venting the entire surface of the rear contact plate of the turning stacker by uniform air discharge after a paper stack has been turned substantially 90°; said paper stack being loosened and aligned by forming an air cushion under the stack and being thereafter turned to a final position; said fork-shaped members having carrying plates or carrying forks for holding the stack to be turned therebetween and have one yoke each; a left- and right-hand spindle; spindle nuts on said spindle and connected to said yoke; said rear contact plate having air discharge openings; an air channel underneath said rear contact plate and having means for air deflection and uniform air distribution underneath said air discharge openings; said air channel having narrow sides with walls displaceable relative to each other.

4,178,120

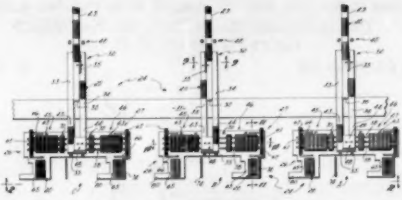
APPARATUS FOR TRANSFERRING ELONGATED ARTICLES FROM A SINGLE FILE SUPPLY INTO PRODUCT BUCKETS OF A CARTONER

Robert J. Weichhand, Ft. Mitchell, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Sep. 1, 1977, Ser. No. 829,589

Int. Cl.[2] **B65G** *57/08*

U.S. Cl. 414—41 **12 Claims**



1. Apparatus for transferring elongated packages into product buckets on a conveyor comprising,

means for feeding packages toward said product bucket conveyor in a direction perpendicular to said conveyor,

two accumulator conveyors running parallel to said product bucket conveyor and in opposite directions, said accumulator conveyors having their upstream ends adjacent one another and adjacent said package feeding means,

a diverter for pushing packages transversely to the length of the packages from said feeding means alternately onto respective accumulator conveyors,

means for pushing packages longitudinally to the length of the packages from said accumulator conveyors onto a dead plate overlying said product bucket conveyor,

and means for sweeping said packages transversely to the length of the packages off said dead plate into product buckets.

4,178,121

REPETITIVE-CYCLE OBJECT HANDLING APPARATUS

Leonard H. Taylor, High Wycombe, England, assignor to Perkin-Elmer Limited, Beaconsfield, Great Britain

Continuation of Ser. No. 776,941, Mar. 14, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,817

Int. Cl.[2] **B65G** *57/00*

U.S. Cl. 414—104 **15 Claims**

1. Repetitive-cycle object handling apparatus comprising, in combination:

(a) a feed station for accommodating a stack of slab-like objects of regular geometry, means for subjecting said stack to a feed force acting in the longitudinal direction of said stack;

(b) a utilization station where objects fed seriatim from the feed station may be made to dwell before being moved on;

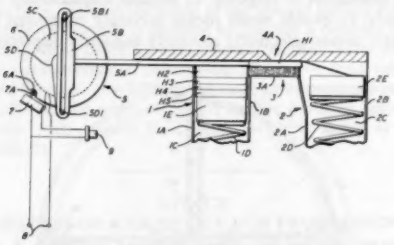
(c) a storage station for stacking one object at a time after the object has dwelled at the utilization station for a predetermined time interval;

(d) object transfer means for sliding out a leading object

from said stack at the feed station to the utilization station and, at the end of said predetermined time interval, to move said object on to the storage station;

(e) an object stacking ramp for guiding an object leaving the utilization station toward a stacking attitude at the storage station under the action of said object transfer means;

(f) means for subjecting the stack of objects in said storage station to a bias force substantially in the longitudinal direction of the stack; and



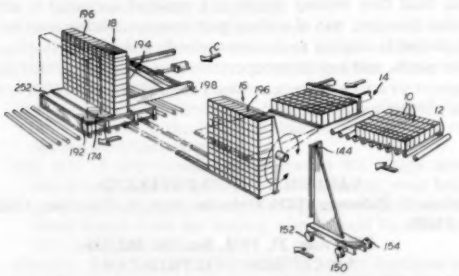
(g) object fulcrum means disposed downstream of the centerline of the storage station stack and downstream of said object stacking ramp for enabling an object to be swung there-around to said stacking attitude under the action of said bias force after said bias force has first been overcome by said transfer means and a predetermined short portion of the object has progressed beyond said fulcrum.

4,178,122

METHOD AND APPARATUS FOR CUBING BRICK

Daniel P. Abrahamson, 3030 N. 56th Dr., Phoenix, Ariz. 85031

Filed Mar. 29, 1978, Ser. No. 891,321
Int. Cl.[2] B65G *57/08*
U.S. Cl. 414—110 **9 Claims**



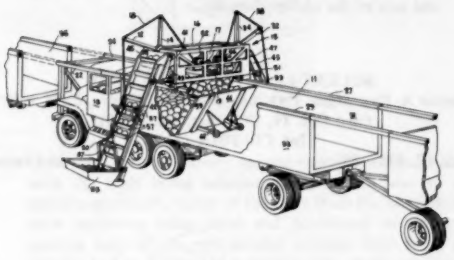
1. In a method for cubing elongated brick which have a flat end, and which are standing on their flat ends with their respective length dimensions oriented uprightly, the steps comprising simultaneously introducing a plurality of said brick into a cradle means in a close-packed relationship with their respective length dimensions generally parallel to one another and oriented uprightly, aligning one flat end of each of said brick in a horizontal plane in said cradle such that said flat ends of said brick occupy a common plane, tilting said cradle means to reorient the length dimension of said brick to a substantially horizontal position, ejecting said reoriented brick from said cradle as a stack unit and in a direction of movement generally parallel to the common plane occupied by said flat ends of said brick, applying a yieldable restraint against at least the upper ones of said brick in the leading edge of said stack as said stack is moved out of said cradle, positioning a pallet under said ejected stack of brick, substantially simultaneously contacting said flat ends of the bricks in said ejected stack and applying a force thereagainst which is sufficient to change the direction of movement of said stack of brick by about ninety degrees, and moving said stack of brick on to said pallet.

4,178,123

TRAILER BOX LOADER SYSTEM

Robert B. Loeffler, 1026 Adams St., Los Banos, Calif. 93635

Filed Dec. 12, 1977, Ser. No. 859,293
Int. Cl.[2] B65G *67/04*
U.S. Cl. 414—523 **9 Claims**



1. A loader system for agricultural trailer boxes or the like comprising,

a trailer box having opposed panels along the length thereof, said panels having beams atop for supporting loads thereon,

a carriage having a frame extending across the width of a trailer box and with opposed wheels connected thereto, positioned for carriage travel on said beams, and

at least one conveyor means having top and bottom portions for lifting agricultural goods over one of the beams atop said panels and transferring said goods into said trailer box, said top portion of said conveyor means upwardly supported from said carriage and extending transverse to the length of the panels of the trailer box and angularly downward from the carriage with the conveyor bottom portion clearing ground level, and

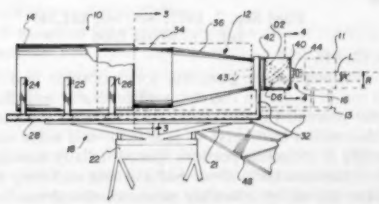
an angularly adjustable bin connected in ground clearance relationship to the bottom portion of said conveyor means, said bin adapted to feed said agricultural goods to said conveyor means.

4,178,124

TURBINE APPARATUS

Alexander Puskas, 718 S. Trenton Ave., Pittsburgh, Pa. 15221

Filed Apr. 17, 1978, Ser. No. 896,930
Int. Cl.[2] F03D *1/04*
U.S. Cl. 415—2 **19 Claims**



1. Turbine apparatus adapted for disposition in a fluid stream to convert the kinetic energy of the fluid flow to mechanical rotation energy comprising:

fluid stream gathering means mounted on a framework for intercepting a portion of the fluid flow in the fluid stream, said gathering means having an inlet port and an exhaust port;

turbine means including a turbine housing rotatably mounted on said frame adjacent to said exhaust port for

rotatably responsing to the portion of the fluid flow intercepted by the inlet port; and

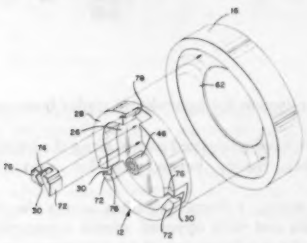
a plurality of passages within said turbine means extending substantially longitudinally along said turbine means and bending about the longitudinal axis of the turbine housing, each of said passages having an inlet at one face of the turbine housing adjacent to the exhaust port and having an outlet at the periphery of the turbine housing, each said passage tapering axially and radially towards the said periphery to emit a fluid jet tangential to the periphery of the turbine housing at about a right angle to the longitudinal axis of the turbine housing.

4,178,125

BUCKET-LESS TURBINE WHEEL

Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577

Filed Oct. 19, 1977, Ser. No. 843,517
Int. Cl.² F01B *1/18*
U.S. Cl. 415—80 **18 Claims**



1. A turbine wheel for use in a turbine comprising:

a flat disk having a hollowed concentric central portion on one side of said disk, an annular rim portion, said rim portion having an inner margin at an interface with the hollowed portion and an outer periphery displaced from said inner margin, and a plurality of nozzles symmetrically spaced around said rim portion said nozzles each comprising a passage through said rim portion from said inner margin to said periphery, said nozzles terminating at said periphery in a portion of said passage directed at an acute angle from a tangent to the periphery of said rim portion, wherein said nozzles each comprise a replaceable inset, said rim portion having a cutout in which said inset is installed.

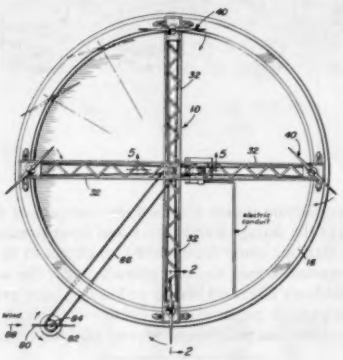
4,178,126

WIND DRIVEN POWER GENERATOR

Gehres D. Weed, Edmonton, Canada, assignor to Altarctic Engineering & Construction Ltd., Edmonton, Canada, a part interest

Filed Sep. 7, 1977, Ser. No. 831,347
Int. Cl.² F03D *7/06*
U.S. Cl. 416—17 **5 Claims**

1. A rotary power generator for disposition in a fluid flow path and to be driven thereby, said generator including a base, a rotor journaled from said base for rotation about a first axis for disposition transverse to said path, said rotor including a plurality of mounting portions spaced radially outwardly from and circumferentially about said axis and including a plurality of vane assemblies rotatably mounted, therefrom for angular displacement about axes generally paralleling said axis, vane assembly displacement control means operatively connected between said base and said vane assemblies for angularly displacing said vane assemblies relative to said mounting portions 180 degrees each 360 degrees of angular displacement of said rotor and in directions opposite to the direction of angular displacement of said rotor, upon rotation thereof, said vane assemblies being variously optimumly angularly positioned relative to said mounting portions and each other to effect substantially maximum thrust therefrom on said rotor as a result of fluid flow thereagainst in one radial direction, said vane assembly displacement control means including angularly displaceable fluid flow sensing means operative to sense angular changes in the radial direction of fluid flow toward said axis to accordingly simultaneously variously angularly position said vane assemblies about their axes of rotation relative to said mounting portions, whereby said vane assemblies are maintained in said optimum position, said control means further including angularly displaceable operator means drivingly connected to said vane assemblies for angularly displacing the vane assemblies in response to angular displacement of said operator, reversible motor means drivingly connected to said operator means selectively reversely angularly displacing said



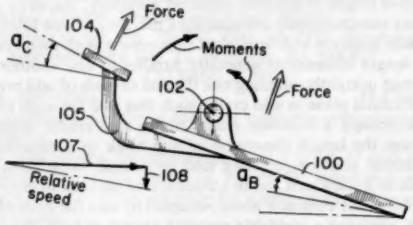
operator means, first and second support structures angularly displaceable with said operator and fluid flow sensing means, respectively, and motor operation controlling switch means and switch actuating means carried by said structures and operatively associated with each other and said motor means for driving said operator means to an angular position corresponding, at least generally, to an angular positional change of said fluid flow sensing means as a result of a change in said radial direction, one of said support structures being angularly displaceable relative to the corresponding angularly displaceable means, and key means operative to releasably key said one support structure in predetermined angular position relative to the corresponding angularly displaceable means.

4,178,127

VARIABLE PITCH IMPELLER

Zoltan P. Zahorecz, 1424 Oakcrest Ave., S. Pasadena, Calif. 91030

Filed Aug. 27, 1975, Ser. No. 585,339
Int. Cl.² B63H *3/00*; F03D *7/04*
U.S. Cl. 416—23 **12 Claims**



1. A mechanism for adjusting the lift angle of a lift surface relative to a fluid medium, dependent upon the relative velocity between the lift surface and the fluid medium, comprising:

a base;

means pivotally coupling the lift surface to said base along a

selected axis, the lift center of the lift surface being spaced apart from the pivot axis;

and a control surface fixedly coupled to said lift surface and extending therefrom to provide a control lift center at a different radial position than the lift center of the lift surface from the pivot axis, the lift components of the control surface and the lift surface acting in response to the fluid medium to provide opposite pivot moments on the lift surface about the pivot axis, such that the angle of the lift surface relative to the fluid medium stabilizes at a position dependent upon the relative velocity of the fluid medium, wherein the angle of the control surface relative to the lift surface is selected to provide a tapering off of the gradient of the lift component from the control surface at a predetermined relationship of relative fluid velocity and lift angle at which the opposite pivot moments cancel, such that the angle of the lift surface is varied automatically with relative fluid velocity but is stable at such velocity.

4,178,128

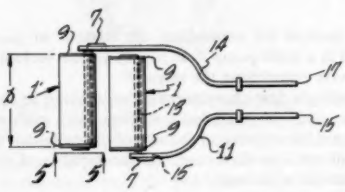
METHOD OF AND DEVICE FOR PROPULSION

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendale, Calif.

Filed May 10, 1977, Ser. No. 795,384

Int. Cl.[2] A63C *31/10*

U.S. Cl. 416—72 **10 Claims**



1. A propulsion device comprising:

a forward foil means and a rearward foil means in nested relationship for alternate transverse reciprocal and alternate pivotal movement in opposed direction about substantially parallel pivot axes;

said forward and rearward foil means axes being substantially parallel to the leading edges of said forward and rearward foil means; and

said axes of said forward and rearward foil means about which said forward and rearward foil means pivot being positioned a distance of less than about one-quarter of the chord length from the leading edge of said forward and rearward foils means;

whereby the wake of the forward foil means increases the resultant velocity component and the forward thrust produced by said rearward foil means and the action of the rearward foil means increases the resultant velocity component and the forward thrust means produced by said forward foil means.

4,178,129

GAS TURBINE ENGINE COOLING SYSTEM

John Jenkinson, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 3, 1978, Ser. No. 874,741

Claims priority, application United Kingdom, Feb. 18, 1977, 6860/77

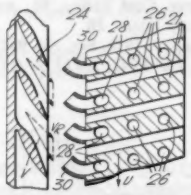
Int. Cl.[2] F01D *5/18*

U.S. Cl. 416—95 **7 Claims**

1. A cooling system for a turbine of a gas turbine engine, said system comprising a turbine rotor with blades extending therefrom:

a plurality of circumferentially closely spaced pre-swirl nozzles defining a substantially continuous annular outlet flow area through which flows, in operation, a cooling fluid; and

a plurality of circumferentially spaced pitot receivers projecting from the blades of the turbine in a direction towards the pre-swirl nozzles and terminating at their free



open inlet ends in closely spaced relation to the nozzles with the ends being substantially perpendicular to the relative approach vector of the fluid from the nozzles, the pitot receivers being sized and positioned to collect a portion only of the pre-swirled cooling fluid from the nozzles and to direct it to a portion only of the interior of each of the blades of the turbine.

4,178,130

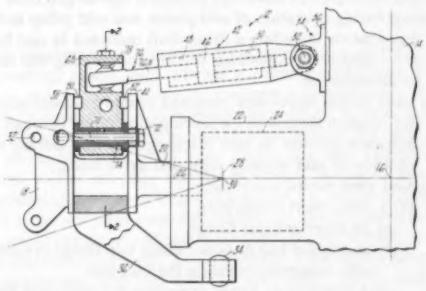
HELICOPTER ROTOR HAVING LEAD-LAG DAMPER OPERABLE WITH PITCH AND FLAP DECOUPLING

Donald L. Ferris, Newtown, and William L. Noehren, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 674,192, Apr. 6, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,064

Int. Cl.[2] B64C *27/38*

U.S. Cl. 416—107 **8 Claims**



1. A helicopter rotor including:

1. a hub mounted for rotation about an axis of rotation,
2. at least one helicopter blade projecting from said hub and having an inboard end adjacent the hub and an outboard end away from the hub,
3. means supporting said blade inboard end from said hub so that said blade will rotate with said hub about said axis of rotation and so that said blade is capable of universal motion with respect to said hub about intersecting lead-lag and flapping axes, and for pitch change motion with respect to said hub about a pitch change axis intersecting said lead-lag and flapping axes,
4. a lead-lag damper supported from said hub so as to be movable in pivot motion in a trajectory lying substantially in a selected plane with respect to said hub,
5. link means extending between said lead-lag damper and said blade,
6. a universal connection connecting said link means to said lead-lag damper, and
7. means pivotally connecting said link means to said blades

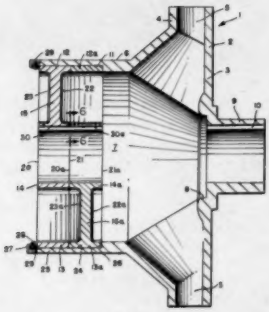
for pivot motion therebetween about a pivot axis offset from at least one of said pitch change and flapping axes.

4,178,131

CENTRIFUGAL IMPELLERS

Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.

Filed Aug. 7, 1978, Ser. No. 931,481
Int. Cl.[2] F04D *13/12, 24/18*
U.S. Cl. 416—175 **6 Claims**



1. In a centrifugal impeller for use in a centrifugal-turbine pump capable of pumping liquids at or near the boiling point thereof with suction heads not greater than about one foot, the impeller including a housing having a front, elongated entrance portion through which such liquid enters said housing, and a rear discharge portion from which liquid entering said housing through said discharge portion is discharged from said housing during operation of said pump, and said pump including drive means including a drive shaft mounted in said housing and operatively connected thereto for rotating the latter, the combination of:

a. vane means removably mounted in said entrance portion for rotation therewith for feeding such liquid through said entrance portion to said discharge portion during such rotation of said housing with said drive shaft,

b. said vane means comprising

(1) a vane insert comprising

(a) an outer annular flange,

(b) an annular hub disposed inside said flange in substantially concentric relation thereto, and

(c) a plurality of vanes extending between said flange and hub in annularly spaced relation to each other,

c. said vane insert being mounted in said entrance portion for rotation therewith, with

(1) the outer peripheral surface of said flange being disposed in closely adjacent relation to the inner surface of said entrance portion, and

(2) said hub being mounted on and secured to said drive shaft for rotation with said drive shaft and said housing during operation of said pump,

d. said flange having

(1) a front face through which such liquid enters in entering into said entrance portion, and

(2) a rear face through which said liquid exits in flowing through said entrance portion to said discharge portion, and

e. each of said vanes having a front face,

(1) facing in the direction of rotation of said impeller insert when the latter is so rotating with said drive shaft, and

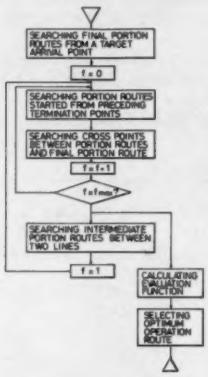
(2) disposed at a rearwardly opening obtuse angle to said front face of said flange.

4,178,132

METHOD AND DEVICE FOR CONTROLLING THE NUMBER OF PUMPS TO BE OPERATED

Atsuko Shiraishi, Kokubunji, and Makoto Shioya, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 751,988
Claims priority, application Japan, Dec. 24, 1975, 50/153315
Int. Cl.[2] F04B *49/06*
U.S. Cl. 417—5 **20 Claims**


SEARCHING FINAL PORTION ROUTES FROM A TARGET ARRIVAL POINT
f = 0
SEARCHING PORTION ROUTES STARTED FROM PRECEDING TERMINATION POINTS
SEARCHING CROSS POINTS BETWEEN PORTION ROUTES AND FINAL PORTION ROUTE
f = f+1
f = fmax ?
SEARCHING INTERMEDIATE PORTION ROUTES BETWEEN TWO LINES
f = 1
CALCULATING EVALUATION FUNCTION
SELECTING OPTIMUM OPERATION ROUTE

1. A method for controlling the number of pumps to be operated in a multi-pump fluid supply system including a pond or reservoir comprising the steps of:

generating a first characteristic line relating to the cumulative values of predicted load flow rates with time and a second line relating to the sum of the cumulative values of predicted load flow rates and the capacity of the pond or reservoir with time;

plotting possible pump operation routes passing through the region between the first and second lines so that the gradient of the route portion of each pump operation route is changed when the route portion reaches one of the first and second lines, until the number of gradient changing points of said pump operation route reaches a predetermined value;

calculating the value of an evaluation function for every pump operation route which has been plotted;

selecting the optimum pump operation route having a most suitable evaluation function; and

controlling the number of pumps to be operated in response to the selected optimum pump operation route.

4,178,133

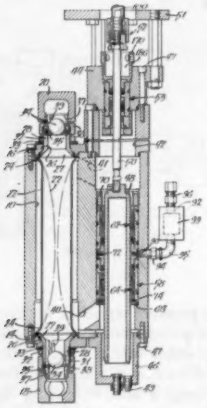
DOUBLE-ACTING FLEXIBLE TUBE PUMP

Waldemar Rawicki, Chicago, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Apr. 14, 1977, Ser. No. 787,358
Int. Cl.[2] F04B *21/00, 35/02, 43/10;* **F16J** *15/44*
U.S. Cl. 417—63 **2 Claims**

1. In a flexible tube pump, a pair of substantially identical pump cylinders each having inlet and outlet openings and a flexible tube in each said cylinder connected at its ends to the inlet and outlet openings thereof; each said connection comprising a frusto-conical recess in the cylinder wall, a hollow stem extending through said opening and having an enlarged frusto-conical head portion complementary to and juxtaposed to said recess comformably receiving the end of the tube, means for drawing said head portion toward and into said recess for compressing the end of the tube between said frusto-conical surfaces, and means on said stem for maintaining a clamping pressure on the tube end; a single control cylinder communicating adjacent one end thereof with one of said pump cylinders exteriorly of the respective tube and adjacent

the other end thereof with the other pump cylinder exteriorly of the respective tube; and a single piston reciprocable in said control cylinder; the improvement comprising two spaced apart seals mounted in said control cylinder and sealingly engaging said reciprocable piston intermediate the two ends of said control cylinder; liquid having a visually detectable coloring; said liquid filling the pump cylinders exteriorly of said tubes and the control cylinder to opposite sides of said two seals; a piston rod connected to and extended from only one end of said piston and extending through only one end of said control cylinder for reciprocating said piston and displacing said liquid and thereby alternately and cyclically contracting



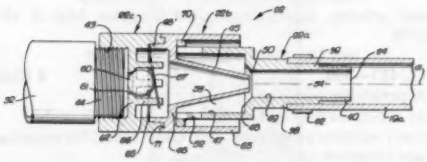
and expanding said tubes to perform a pumping function; the end of said piston opposite said piston rod being unobstructed, hollow and having a larger effective piston area than the other end of said piston, said piston being of relatively large diameter in relation to the diameter of the piston rod for minimizing the differential between the effective areas of the two ends of the piston and thus the liquid displacement thereof; and a sight glass in communication with said control cylinder in the space therein between said two seals, whereby the liquid leaking past either seal, itself, gives a signal when it is detected in said sight glass and before it passes the other seal so that damage to said tubes is averted.

4,178,134

ENGINE COOLANT SYSTEM FLUSH ATTACHMENT FOR COOLANT HOSE

John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Filed Jan. 6, 1978, Ser. No. 867,527
Int. Cl.[2] F01P *11/06*
U.S. Cl. 417—181 **13 Claims**



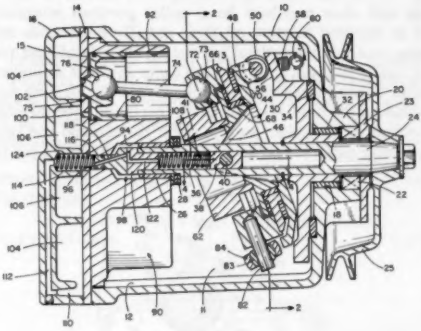
1. In combination with an engine cooling fluid duct,
(a) body means having an outlet portion coupled to an end of the duct,
(b) the body means having an inlet portion to receive pressurized fluid from a flush fluid source line for flow into the duct,
(c) aspirating means including a forwardly tapering duct portion associated with said body means to aspirate air into the pressurized fluid flow into the duct,
(d) check valve means associated with said body means to pass the pressurized flow generally forwardly in the body to the duct and to block reverse flow from the duct into the source line, and
(e) pressure release means associated with said body means and spaced generally outwardly of said duct portion to release excessive pressure in the duct at a predetermined pressure level,
(f) said check valve means located generally in alignment with, and directly rearwardly of the forwardly tapering duct portion.

4,178,135

VARIABLE CAPACITY COMPRESSOR

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 16, 1977, Ser. No. 861,386
Int. Cl.[2] F04B *1/14*
U.S. Cl. 417—222 **6 Claims**



1. A compressor comprising: means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a compressible fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a swash plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said swash plate and the individual pistons to impart reciprocating drive to said pistons; means for supporting said swash plate and said cam mechanism for pivotal movement with respect to the axis of said drive shaft, the pivot point lying along said drive shaft axis; a cam follower associated with said cam mechanism, said cam follower including a roller, and an axially fixed cam surface cooperating with said roller, said roller engaging said axially fixed cam surface to shift the pivot point of said swash plate along said drive shaft axis to vary the stroke.

4,178,136

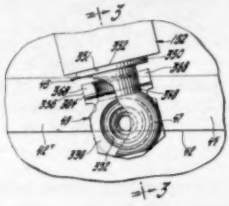
GUIDE SHOE MEMBERS FOR WOBBLE PLATE COMPRESSOR

Earl Reid, Dayton, and Carl A. Copp, Jr., Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 2, 1978, Ser. No. 911,818
Int. Cl.[2] F04B *1/14*
U.S. Cl. 417—269 **1 Claim**

1. In a compressor having a housing, a cylinder block disposed in one end of said housing forming longitudinally aligned cylinder bores receiving pistons therein, a working chamber defined between said block and one wall of said housing, a drive shaft rotatably supported in said working chamber, an annular wobble plate operated in response to

rotation of said drive shaft and drivingly connected to said pistons at locations therearound spaced radially from said drive shaft to reciprocate said pistons, means for translating the movement of said wobble plate into reciprocation of the pistons, said housing having a longitudinally extending guide slot formed therein in a common plane with said drive shaft and defining opposed substantially parallel plane bearing faces of predetermined depth, at least one of the driving connections of said wobble plate to its respective piston being spaced transversely from said common plane and said bearing faces whereby during movement of said wobble plate a driving force occurs at said one driving connection which is offset from said common plane, said wobble plate supporting a radially extending cylindrical rod portion formed with a ball on its outer end, said ball positioned for longitudinal and arcuate travel in said slot as a result of said wobble plate movement and tending toward travel lateral to said slot as a result of said offset force, and a pair of spaced guide shoe members positioned in said slot on opposite sides of said ball, said shoe members having concave recesses on opposing surfaces thereof facing each other for receiving and retaining said ball therebetween, said shoe members each having an outer bearing surface in bearing contact with its associated slot bearing face, the improvement wherein said shoe members have collar portions integrally formed in opposed relation on their radially inner ends and extending in a common plane normal to the axis of said rod portion, said collar portions forming outer surfaces as inward extensions of their associated shoe member outer bearing surfaces, wherein the total outer surface of each said shoe member is comprised of the collar portion outer surface and the shoe member outer surface, said total outer surface having a predetermined dimension along said rod portion greater than the predetermined depth of the associated slot bearing face, said collar portions having opposed inner surfaces each formed as a cylindrical surface portion positioned in conforming bearing contact with said rod portion, each said cylindrical surface portion extending through a predetermined arc less than a one-half circle to form a pair of shoulder portions, each shoulder portion of each pair of shoulder portions being located in opposed sufficiently spaced relation with the respective shoulder portion of the other pair so that a predetermined clearance is provided between the shoulder portions of each shoe member during longitudinal movement of the shoe members in said slot and during any limited pivotal movement of the shoe members about the axis of said rod portion, thereby to compensate for the travel of said ball longitudinally, arcuately and laterally in said slot, and whereby the travel of said ball to predetermined angular locations in said slot moves a portion of the outer bearing surface of each shoe member into a non-bearing relation with the bearing faces of said slot, said outer surface of each collar portion of said shoe member then moving into bearing relation with its slot bearing face to compensate for such non-bearing relation by replacing that portion of each shoe member outer bearing surface that is in non-bearing relation with another portion of said shoe member outer bearing surfaces thereby to insure substantially constant bearing contact areas between each said show member and its associated bearing face of the guide slot, and whereby cooperation between said rod portion and said cylindrical surface portions prevent the outer surface of either shoe member from being canted into a non-parallel orientation with respect to each other bearing face to thereby minimize undesirable wear of the bearing faces by reason of gouging thereof by said shoe members.



4,178,137

PRESSURE REGULATOR FOR A FLUID PUMP

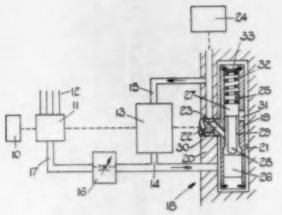
Colin P. Brotherston, Banstead, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 22, 1977, Ser. No. 863,316

Claims priority, application United Kingdom, Jan. 4, 1977, 00104/77

Int. Cl.[2] F04B *49/08*

U.S. Cl. 417—294 **5 Claims**



1. A centrifugal pressure regulator for controlling the output pressure of a fluid pump associated with said regulator, comprising: a body rotatable within a cavity, the speed of rotation of said body about its axis of rotation determining the output pressure of the pump, a bore extending diametrically within the body, one end portion of said bore being of larger diameter than the other end portion, a first piston slidable in said one end portion of the bore, a second piston slidable in the other end portion of the bore, abutment means extending between the two pistons and defining therebetween and the wall of the bore a spill chamber, said pistons being subjected at their outer ends to the pressure in said cavity and having their combined mass, together with the mass of the abutment means offset relative to the axis of rotation of the body in the direction of the larger piston, a spill port in the wall of said bore, said spill port placing said cavity and spill chamber in communication with each other, the size of said spill port being controlled by said second piston, resilient means biasing said piston in the direction to reduce the size of said spill port, an outlet communicating with said spill chamber for fuel which has flowed through said spill port, an inlet to said cavity and which in use is connected to the outlet of the pump, and means for restricting the rate of movement of the pistons with variation of speed and/or output pressure.

4,178,138

CARTRIDGE FOR PERISTALTIC PUMP

Frank Iles, "Loscombe", Four Lanes, Redruth, Cornwall, TR16 6LP England

Filed Apr. 26, 1977, Ser. No. 790,892

Claims priority, application United Kingdom, May 5, 1976, 18471/76

Int. Cl.[2] F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—360 **4 Claims**

1. A peristaltic pump comprising

body means having a chamber with an open mouth;

a rotary member mounted in said body means for rotation in said chamber; and

a cartridge adapted to be releasably mounted in said chamber through said open mouth, said cartridge comprising

a housing with a bore for receiving said rotary member when said cartridge is mounted in said chamber,

a tube with a flexible wall extending through said housing, said tube having a convolution with at least a part thereof encircling said bore,

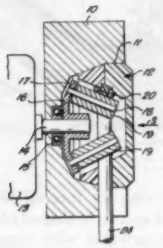
a rib integrally mounted on said tube and extending along

the longitudinal extent thereof, said rib narrowing in cross section to a neck adjacent said tube, and

a recess formed in said housing and encircling said bore, said recess having a width similar to that of said neck to entrap the rib therein and thereby hold said tube in said bore;

said rotary member being rotatable about the axis of the bore and having at least one eccentrically mounted element thereon for engaging and pressing the wall of the tube; and clamping means for releasably holding said cartridge in said chamber, said clamping means including

openings on opposite sides of the encircling wall of said chamber,



a pair of pins extending through said body means with one pin on each side of said body means;

resilient biasing means for resiliently biasing said pins so that the side portions thereof project into said chamber through said openings;

a groove on the outer surface of said cartridge adapted to receive the side portions of said pins, and

releasable locking means for holding said pins in said opening to hold said cartridge in place when located in said chamber;

whereby, upon rotation of said rotary member when said cartridge is in said chamber, said rotary member traverses said convolution and, by depressing said tube, causes fluid in said tube to flow.

4,178,139

CISTERN PUMPING PLANT

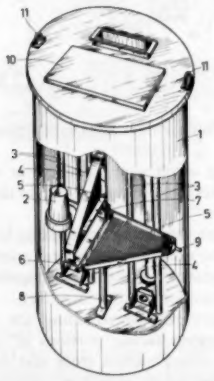
Rauno Seppänen, Kerava; Hannu Sarvanne, and Sixten Jakobsson, both of Vantaa, all of Finland, assignors to Oy E. Sarlin AB, Helsinki, Finland

Filed Feb. 10, 1978, Ser. No. 876,830

Claims priority, application Finland, Feb. 14, 1977, 770478

Int. Cl.[2] **E02D** *29/12*

U.S. Cl. 417—360 **5 Claims**



1. A cistern pumping plant comprising at least one pump within a cistern having a vertical wall; a plurality of guides; a servicing platform, said guides located between said platform and the wall and extending from a lower portion of said cistern below said platform to an upper portion of said cistern above said platform, said pump being liftable for maintenance and repairs along said guides up onto said servicing platform inside said cistern; said servicing platform comprising a plate hinged to the cistern and being turnable from a horizontal position, whereby a pump that is in need of being serviced being liftable directly into position above the servicing platform that has been turned to its open position whereupon the servicing platform is turned to its horizontal position and the pump is lowered to rest thereupon.

4,178,140

COMPRESSOR WITH RECIPROCATING PISTON PARTICULARLY FOR SMALL REFRIGERATORS

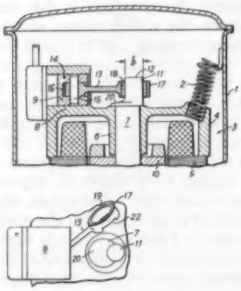
Hans J. Tankred, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 774,890, Mar. 7, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,258

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609653

Int. Cl.[2] **F04B** *17/00, 35/04;* **B23P** *15/10*

U.S. Cl. 417—415 **1 Claim**



1. A compressor assembly comprising a sealed housing, an electric motor having a casing and being resiliently mounted in said housing, said motor having a vertically disposed shaft, an offset crankpin attached to the upper end of said shaft, a cylinder member having a cylindrically shaped chamber attached to the upper side of said motor casing, a piston slidably mounted in said chamber, said chamber having a diameter larger than the axial length of said crankpin, a connecting rod having a shaft portion with the piston end thereof pivotally connected through cylindrically shaped pin means to said piston and crank end thereof connected in relatively rotatable relation to said crankpin, said connecting rod crank end being a generally annularly shaped ring with annular surfaces on opposite sides thereof and having a bore larger than the diameter of said crankpin, a sleeve between said connecting rod ring and said crankpin, one of said crank end annular surfaces having a recess for facilitating assembly which is displaced 90 degrees from the front between said ring and said shaft portion and which has a width at least equal to the diameter of said crankpin.

4,178,141

FUEL INJECTION PUMP FOR AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINES

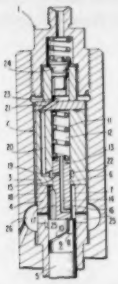
Heinz Scheying, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,292

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647788

Int. Cl.[2] F04B *7/04*

U.S. Cl. 417—498 **16 Claims**



1. A fuel injection pump for internal combustion engines, the injection pump comprising control slide valve means longitudinally displaceably guided in a pump housing part, a displaceable pump piston means for opening and closing a fuel control bore communicating with a pump working space means and for displacing the control slide valve means, spring means for biasing the control slide valve means, said control slide valve means including first bore means for temporarily connecting the pump working space means with a pump pressure space means, the control slide valve means and the pump piston means being arranged substantially coaxially to each other in a pump cylinder means, characterized in that the control slide valve means rests on the pump means, second bore means provided in the pump housing part in which the control slide valve means is longitudinally displaceably guided for communicating the first bore means with the pump pressure space means in dependence upon a positioning of the control slide valve means, the control slide valve means further including a recess means disposed essentially in a lower half of the control slide valve means for communicating the pump working space means with the second bore means in dependence upon a positioning of the control slide valve means, the recess means extend in a direction of displacement of the control slide valve means and terminates in a surface which is slightly inclined in a direction toward an outer circumference of the control slide valve means, whereby, upon a longitudinal displacement of the control slide valve means by the pump piston means, the working pressure space means is in communication with the pump working space means alternately by either the first bore means or the recess means.

4,178,142

DOUBLE-CYLINDER PUMP ESPECIALLY FOR CONVEYING CEMENT

Friedrich Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,667

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632816

Int. Cl.[2] F04B *15/02*

U.S. Cl. 417—516 **9 Claims**

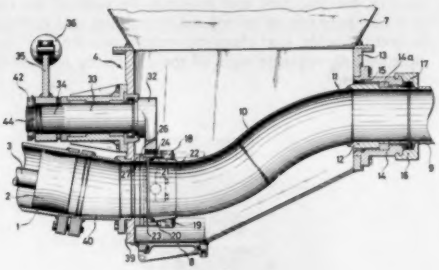
1. A double cylinder pump for a viscous, abrasive material comprising:

frame means having a pair of material conveyor cylinders providing a pair of delivery openings surrounded by a spectacle shaped plate;

a driven distribution pipe having an end swivellingly movable between said two openings for receiving the discharge of said cylinders;

a wearing ring carried by said distribution pipe adjacent its end for contacting said spectacle shaped plate throughout the swivelling movement of said pipe; and

a pressure device anchored in said frame means and coupled



to said wearing ring for forcing said wearing ring into contact with said spectacle shaped plate, said wearing ring being relatively movable with respect to said pressure device and said pipe responsive to the contact with said spectacle shaped plate to obtain sealing abutment between said ring and plate and for accommodating wear to said ring and plate from the viscous, abrasive material.

4,178,143

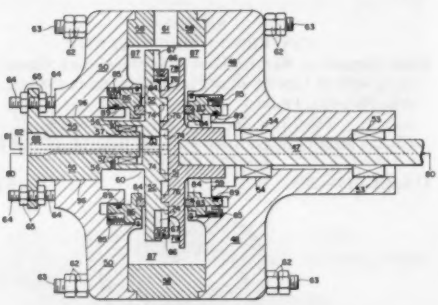
RELATIVE ORBITING MOTION BY SYNCHRONOOUSLY ROTATING SCROLL IMPELLERS

William G. Thelen, Onondaga, Mich., and Thomas W. Bein, Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1978, Ser. No. 891,963

Int. Cl.[2] F01C *1/02, 21/14;* **F04C** *1/02, 15/02*

U.S. Cl. 418—19 **1 Claim**



1. A positive displacement fluid pump comprising:

a casing;

a pair of facing scroll vane impellers in operative meshed relationship rotatably mounted within the casing on parallel offset axes;

one port through the casing terminating between the impellers near their axes of rotation and another port through the casing located radially of the impellers;

means for rotating one of the impellers;

ring means outwardly surrounding the scroll vanes and slidably engaging facing portions of each impeller for transmitting rotary motion from said one impeller to the other impeller while permitting relative orbital motion therebetween whereby fluid is caused to flow between the scroll vanes and through the ports; and

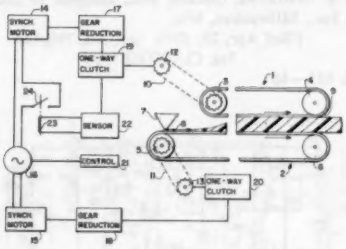
means for adjusting the distance between the impeller axes for controlling pump output.

4,178,144

MOLDING CONVEYOR DRIVE

Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Sep. 22, 1977, Ser. No. 835,780
Int. Cl.[2] B29C *15/00*; B29D *27/00*
U.S. Cl. 425—150 **13 Claims**



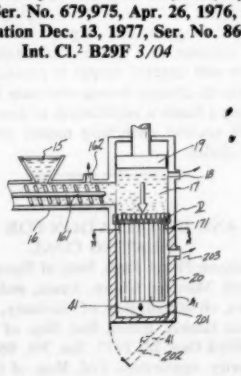
1. Apparatus for molding non-rigid material into rigid indefinite length product employing a top endless molding belt conveyor and an opposed bottom endless molding belt conveyor, forming therebetween opposed endless molding surfaces, and means to drive both belts so that upon start-up when only non-rigid material is between the belts the belts may be driven at substantially the same speed, wherein the improvement is in means to prevent shearing forces from distorting the product through inherent small differences in conveyor speed, comprising: mechanical coupling means between said drive means and only one of said conveyors for normally transferring driving power from said drive means to said one conveyor only; and means for disconnecting said mechanical coupling means when the other of said conveyors is being driven at a speed greater than said one conveyor so that said other conveyor may drive said one conveyor through the rigid product at a common speed.

4,178,145

EXTRUSION DIE FOR CERAMIC HONEYCOMB STRUCTURES

Shoichi Hamamoto, and Masaaki Hiwatashi, both of Kyoto, Japan, assignors to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 679,975, Apr. 26, 1976, abandoned.
This application Dec. 13, 1977, Ser. No. 860,053
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—199 **20 Claims**



1. An extruder comprising:

an extrusion die of the type having an inlet and outlet face for forming honeycomb structures from extrudible material, said extrusion die comprising:

a plurality of intersecting discharge slots forming appropriately arranged core pins, said slots being of a predetermined width and formed in said die to a predetermined depth in a direction from the outlet face of said die towards the inlet face; and

a plurality of mutually independent feed passageways formed in a direction from the inlet face of said die towards the outlet face and communicating with said discharge slots, said feed passageways being placed midway on a side of said core pins, said passageways furtner having a cross sectional area larger than the total cross sectional area of the discharge slots which are feed by said feed passageways; and

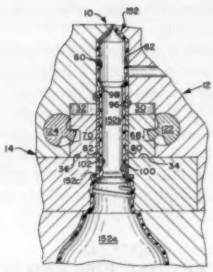
a bucket having an open upper and a closed lower end coupled to the outlet face of said extrusion die, said bucket further being provided with an evacuation outlet whereby the bucket is evacuated to facilitate the initial drying of said honeycomb structure for maintaining the structural integrity of the honeycomb structure.

4,178,146

MOLD HAVING CUTTER MEANS

John P. Kinsley, Hanover Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,272
Int. Cl.[2] B29F *5/00*; B29D *23/03*
U.S. Cl. 425—289 **10 Claims**



1. In a mold for forming a hollow article about a central axis of the mold, the article having a body portion, an extension portion, and a transverse shoulder joining the body portion and the extension portion, the mold having a first mold portion defining a cavity for forming the body portion and transverse shoulder of a hollow article, and a second mold portion defining a cavity extension communicating with the cavity for forming the extension portion of a hollow article, the mold comprising a pair of partible mold members cooperating to provide the first and second mold portions, a cutter means, and actuating means for moving the cutter means axially relative to the first mold portion and into cutting relation with the transverse shoulder of a formed hollow article to sever the extension portion thereof from the body portion thereof while the formed hollow article is in the mold, the improvement comprising the features that the second mold portion is axially immovable relative to the first mold portion, and the cutter means is axially movable relative to the second mold portion, whereby the cutter means is movable into said cutting relation without effecting substantial axial movement of a formed hollow article relative to the mold.

4,178,147

STRETCHER OF DOUGH FOR CAKES, BREAD AND THE LIKE

Torahiko Hayashi, 2-3 Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

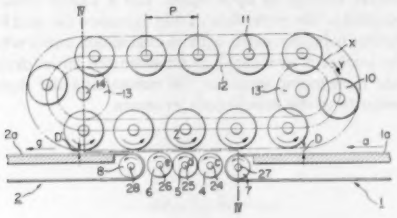
Filed Jan. 25, 1977, Ser. No. 762,319

Claims priority, application Japan, Jan. 27, 1976, 51-7648

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] A21C *3/02*

U.S. Cl. 425—372 **6 Claims**



1. An apparatus for continuously stretching dough for cakes, bread or the like, comprising:

(a) a plurality of rotatable stretching rollers movable in unison about an endless roller path having a lower straight portion;

(b) means spaced below said lower straight portion fr transporting dough into engagement with those of said stretching rollers moving along said lower straight portion, said transport means including an intake conveyor belt having a portion facing said lower straight portion and at least one rotatable transport roller facing said lower straight portion and disposed in series relation downstream of said intake conveyor belt;

(c) means operatively associated with said intake conveyor belt and each transport roller for driving them at respective speeds, said speeds being progressively faster in the downstream direction of dough transport; and

(d) means operatively associated with said stretching rollers for moving them along said lower straight portion in the same direction as the dough transport and at a linear speed faster than the peripheral speed of any transport roller.

4,178,148

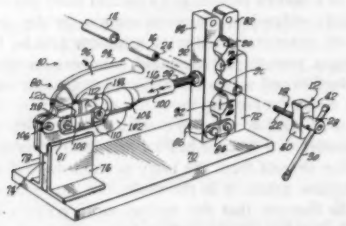
TOOL FOR FLARING PIPE END PORTIONS

Robert E. Bunch, 2754 Arrow Hwy., Sp#22, LaVerne, Calif. 91750

Filed Aug. 22, 1978, Ser. No. 935,894

Int. Cl.[2] B29C *17/02*

U.S. Cl. 425—393 **17 Claims**



1. Tool apparatus for flaring the end portion of a plastic pipe and the like, comprising:

a flaring head having a circular forming recess confronting and adapted to receive the pipe end portion and having a cam edge portion adjacent to the forming recess to engage and deform the pipe end portion,

mandrel means threadedly connected with the flaring head for movement of the flaring head toward the mandrel means in a forming directions, and

means mounting the mandrel means and the pipe end portion in clamped relation to prevent relative movement therebetween.

4,178,149

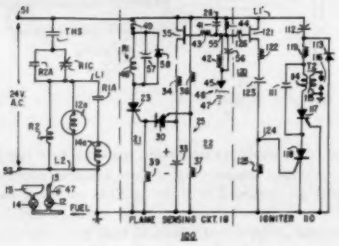
FUEL IGNITION CONTROL SYSTEM

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Apr. 25, 1977, Ser. No. 790,408

Int. Cl.[2] F23Q *9/14*

U.S. Cl. 431—46 **23 Claims**



1. In a fuel ignition control system including valve means having a pilot valve operable to supply fuel to a pilot outlet for ignition by sparks provided by an igniter means to establish a pilot flame, and a main valve operable to supply fuel to a main burner for ignition by the pilot flame, a control arrangement comprising activate means operable to extend a cyclical AC signal to said control arrangement and for energizing said pilot valve, and flame sensing means including first switching means operable when enabled to energize said main valve, control means including second switching means operable when enabled to effect the enabling of said first switching means, circuit means including capacitor means which is charged by said AC signal to provide a signal for enabling said second switching means, sensor means including energy storage means for permitting said sensor means to provide a control output whenever a pilot flame is provided, and enabling means responsive to said sensor means to be operable in the absence of said control output to control the charging of said capacitor means for preventing the enabling of said second switching means in the absence of a flame, said enabling means being operable when said control output is provided to permit said capacitor means to charge during alternate half cycles of said AC signal when a flame is established, to provide said enabling signal for said second switching means during one of said alternate half cycles.

4,178,150

PROCESS AND INSTALLATION FOR DRYING AND HEATING COAL

Claus Flockenhaus; Horst Fach, both of Essen; Günter Gabriel, Wattenscheid; Manfred Galow, Essen, and Joachim Meckel, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,795

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659335

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 **9 Claims**

1. A process for subjecting coal to a drying and subsequent heating step,

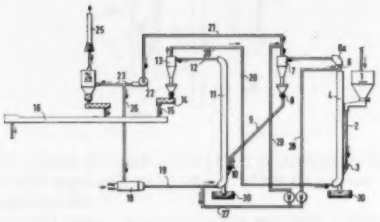
said process comprising

passing the feed coal through a flow-through drying zone while in contact with a heat carrier gas,

then separating the coal from the exhaust gas and discharging the latter into the atmosphere,

passing the dried coal thereupon into and through a flow-through heating zone where the coal is heated to a temperature in excess of 150° C. while in contact with a heat carrier gas,

separating the hot coal from the exhaust gas of the heating zone



recovering the coal while passing the separated exhaust gas from the heating zone into said drying zone, a portion of the hot gas generated in a combustion zone being branched off to be passed into the exhaust gas from the drying zone at the place where the said exhaust gas leaves said drying zone or at the place where said exhaust gas is subsequently separated from the dried coal or being passed into the exhaust gas from the drying zone at both of these places so as to prevent the temperature of the exhaust gas from sinking to or below the sulfuric acid or water vapor dewpoint.

4,178,151

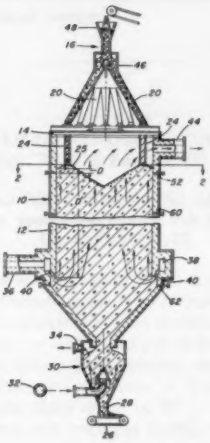
APPARATUS FOR MONITORING THE FEEDING OF PARTICULATE MATERIALS TO A PACKED BED FURNACE

Allan C. Huestis, Georgetown, S.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed Mar. 2, 1978, Ser. No. 883,435

Int. Cl.[2] F27B *1/00, 1/10*

U.S. Cl. 432—1 **10 Claims**



9. A method of detecting a blocked feed tube in a generally vertical direct reduction furnace in which said furnace has a plurality of feed tubes for charging particulate metal oxide material into the top of said furnace to establish a particulate metal oxide burden therein, means for removing metallized particles from the bottom thereof to establish a continuous gravitational flow of the burden through said furnace, and means for establishing a counter-current flow of hot reducing gas through said burden, said method comprising:

(a) continuously monitoring the temperature of the burden in the region of each feed tube:

(b) continuously comparing the temperatures so monitored; and

(c) whereby a significant temperature change indicates that the feed tube has become blocked.

4,178,152

CELL FRAGILITY TESTING METHOD AND APPLIANCE THEREFOR

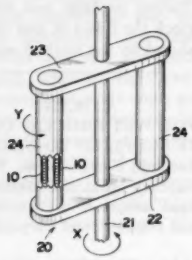
Yoshiaki Nunogaki, Nagaokakyo, Japan, assignor to Sanki Engineering Ltd., Japan

Filed Feb. 22, 1978, Ser. No. 880,159

Claims priority, application Japan, Feb. 24, 1977, 52-19611; Feb. 24, 1977, 52-19612; Feb. 24, 1977, 52-19613

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **5 Claims**



1. A coil column for use in a coil planet centrifuge for developing a hematologic pattern of blood, which comprises:

an elongated tube;

a support rod around which said elongated tube is helically wound, the opposed ends of said tube being retained in position at corresponding end portions of the support rod;

retainers one for each end of the support rod for retaining the opposed ends of said tube at said corresponding end portions of the support rod; and

an aqueous solution of a salt filled in the hollow of said tube and having a concentration gradient over the substantially entire length of said tube, said salt being selected from the group consisting of NaCl, NaBr, KCl, and KBr, and said solution being mixed with a viscosity modifier which is selected from the group consisting of monosaccharides, oligosaccharides, neutral polysaccharides, electrolytic polysaccharides, water-soluble proteins, synthetic water-soluble polymers, semisynthetic water-soluble polymers and glycerol.

4,178,153

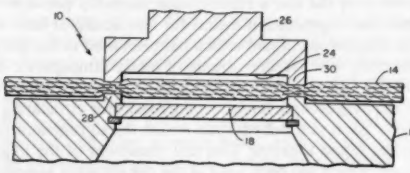
METHOD AND APPARATUS FOR CHEMICAL SPOT TEST ANALYSIS

Lester A. Sodickson, Newton, Mass., assignor to Damon Corporation, Needham Heights, Mass.

Filed Nov. 21, 1977, Ser. No. 853,435

Int. Cl.[2] G01N *33/16, 21/24*

U.S. Cl. 23—230 R **27 Claims**



1. In the constituent analysis of sample material on a porous medium by reaction in liquid state with reagent to produce a constituent-manifesting reaction product, and in which the reaction product is produced at the analysis site with only an optically-thin concentration, the analysis site is illuminated with incident electromagnetic radiation, and electromagnetic radiation resultant from the incident radiation and responsive to the concentration of the reaction product is sensed from a field of view within the analysis site, the improvement comprising the further successive steps of

A. pretreating the medium to bear at least one reagent in a dry state, and

B. introducing liquid to the reaction site for initiating the reaction which produces the reaction product, said introduction delivering the liquid centrally on the site and at a selected controlled rate substantially corresponding to the rate at which the liquid delivered to the central site portion enters the medium and is absorbed therein outward from the central location.

4,178,154

LIGHT SYNTHETIC FUEL

Henri Rothlisberger, 32 Blvd. Edouard VII, Beaulieu sur Mer, France

Filed Feb. 4, 1976, Ser. No. 655,229

Claims priority, application France, Feb. 5, 1975, 75 04397

Int. Cl.[2] C10L *1/02*

U.S. Cl. 44—53 **1 Claim**

1. A method of manufacturing a light fuel for internal combustion engines comprising the steps of crushing and composting a cellulose to separate the lignin therefrom, subjecting said lignin-free cellulose to acid hydrolysis to form a glucose, mixing said glucose with a basic medium and fermenting said mixture at a pressure on the order of 30 to 50 atms., and a temperature on the order of 75° to 90° C. to form isopropyl alcohol, converting said isopropyl alcohol to isopropyl ether, combining said isopropyl ether with a minor amount of a isoctane and subjecting said combination to a cobalt catalyst, selected from the group consisting of cobalt aluminate or/and cobalt acetate, said catalysis being carried out at about 500° C. at a pressure of about 50 atms. and an inert atmosphere for about 10 to 20 seconds.

4,178,155

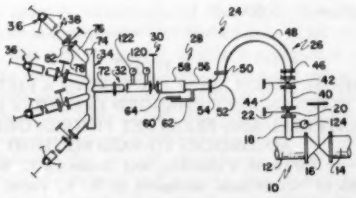
PIPELINE BLOW DOWN TECHNIQUE

Bernie B. Smith, Jr., P.O. Box 10251, Corpus Christi, Tex. 78410

Filed Jan. 9, 1978, Ser. No. 868,218

Int. Cl.[2] F17D *3/00*

U.S. Cl. 48—191 **10 Claims**



8. An installation for blowing down a high pressure pipeline having a block valve for controlling flow through the pipeline and a blow down valve adjacent the block valve, comprising

a pipe section for connection to the blow down valve having means for accommodating movement of the pipe section due to thermal expansion and contraction;

a throttling valve for creating a pressure drop downstream thereof;

means for heating material inside the pipe section; and

means connected to the pipe section for burning substantially all of the material emitting therefrom.

4,178,156

PROCESS AND APPARATUS FOR THE COLLECTION OF HIGH-RESISTANCE DUST

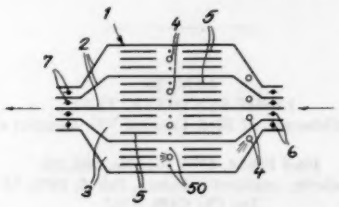
Koji Tashiro, Miki, and Yoichi Matsumoto, Takasago, both of Japan, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,430

Claims priority, application Japan, Jul. 5, 1976, 51-79079

Int. Cl.[2] B03C *3/08*

U.S. Cl. 55—5 **9 Claims**



1. A process for collecting high-resistance dust from a gas stream entraining same in an electrostatic precipitator having dust-collecting electrodes and discharge electrodes, said process comprising the steps of:

(a) interrupting the flow of said gas stream through a part of the flow cross section of said electrostatic precipitator by closing off said part of said flow cross section between opposite ends thereof;

(b) electrically de-energizing the electrodes selectively of said part of the flow cross section of said electrostatic precipitator;

(c) discharging dust from the dust-collecting electrodes of said part of said electrostatic precipitator selectively by rapping the dust-collecting electrodes of said part while they are de-energized;

(d) spraying a conductivity-increasing substance into said part of said flow cross section between the closed-off ends thereof while the electrodes of said part are denergized;

(e) re-energizing the electrodes of said part of said electrostatic precipitator, thereby attracting said conductivity-increasing substance at least in part to said dust-collecting electrodes of the closed-off part whereby said substance adheres to said dust-collecting electrodes in said part of said electrostatic precipitator; and

(f) readmitting said stream of gas to said part of said electrostatic precipitator to effect removal of dust from the readmitted gas stream, the removal of dust from the gas stream continuing in the balance of the flow cross section during steps (a) to (e).

4,178,157

METHOD FOR MANUFACTURING A FILTER OF ELECTRICALLY CHARGED ELECTRET FIBER MATERIAL AND ELECTRET FILTERS OBTAINED ACCORDING TO SAID METHOD

Jan van Turnhout, Pijnacker, and Johannes C. Rieke, Delft, both of Netherlands, assignors to N. V. Verto, Rotterdam, Netherlands

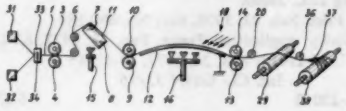
Filed Dec. 21, 1977, Ser. No. 862,768

Claims priority, application Netherlands, Dec. 23, 1976, 7614376

Int. Cl.[2] B03C *3/00*; **B29C** *24/00*

U.S. Cl. 55—155 **6 Claims**

1. A method for manufacturing a filter of electrically charged electret fiber material, consisting of a high-molecular weight, non-polar polymeric substance, comprising the steps of: continuously supplying a foil of said substance, drawing, charging and fibrillating of the foil and the processing of the thus obtained filter material into a filter, selecting the foil and/or the type of drawing to manufacture spontaneously crimpable fiber material, winding said material in uncrimped



condition to a fibrous package and subsequently effecting crimping to interlock the fibers of said fibrous package.

6. A filter produced by the method according to claim 1.

4,178,158

APPARATUS FOR WET PROCESS DEHYDRATION OF AIR TO BE SUPPLIED TO BLAST FURNACE

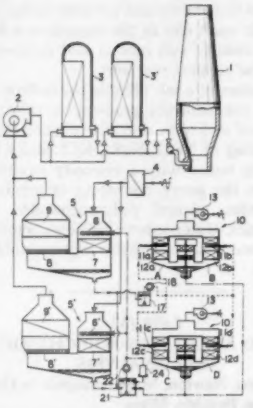
Toru Yoshida, Hachioji; Kameo Hosoi, Warabi; Takehisa Tanaka, Yokohama; Seiji Hirai, and Masakazu Nakauji, both of Sakai, all of Japan, assignors to Takasago Thermal Engineering Co., Ltd. and Nippon Steel Corporation, both of Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,470

Claims priority, application Japan, Jun. 3, 1977, 52-64663; Jun. 3, 1977, 52-64665

Int. Cl.[2] B01D *53/14, 47/14*

U.S. Cl. 55—160 **9 Claims**



1. An apparatus for continuous dehydration of atmospheric air to be supplied by a blower to a blast furnace comprising a dehydration assembly provided with at least one dehydration means for contacting a stream of intake atmospheric air with regenerative hygroscopic liquid so as to reduce the moisture content of the air, a regeneration assembly provided with at least one regeneration means for contacting at least a part of the hygroscopic liquid which has been used in the dehydration assembly with another stream of intake atmospheric air under heating by a fluid heating medium so as to regenerate said part of the hygroscopic liquid, piping means for circulating through the or each said dehydration means the so regenerated hygroscopic liquid together with any remainder of the hygroscopic liquid which has been used in the dehydration assembly, and a duct for passing the dehydrated air coming from the dehydration assembly to the input side of said blower, characterized in that

(a) a cylinder is provided through which at least a part of the hygroscopic liquid flowing through said piping means is caused to flow so as to provide a liquid head of a predetermined height;

(b) means for continuously detecting the concentration of

the hygroscopic liquid flowing through said cylinder is provided;

(c) said regeneration assembly is of such a size that it can handle the maximum regeneration load expected throughout the year, and is divided into a plurality of regeneration units, each regeneration unit being provided with the regeneration means for its own, means for controlling the flow rate of the fluid heating medium introduced into said regeneration means in accordance with a signal from said means for detecting the concentration of the hygroscopic liquid, and means for controlling the flow rate of the hygroscopic liquid introduced into said regeneration means directly or indirectly in accordance with a signal from said means for detecting the concentration of the hygroscopic liquid, whereby each unit is controllably operable independently of other units; and

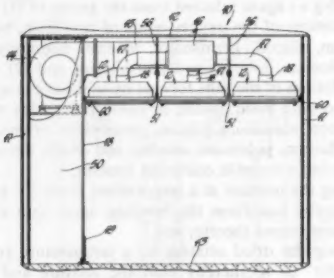
(d) each regeneration unit is further provided with at least one heat exchanger for transferring sensible heat of at least one fluid, of the regenerated hygroscopic liquid, fluid heating medium and air, leaving the regeneration means of said unit to at least one fluid, of the hygroscopic liquid to be regenerated and intake atmospheric air, introduced into said unit.

4,178,159

CLEAN ROOM FILTER ASSEMBLY

Ronald D. Fecteau, 14203 Huff, Warren, Mich. 48091

Filed Sep. 21, 1977, Ser. No. 835,154
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—385 A **10 Claims**



7. A clean room filter assembly comprising:

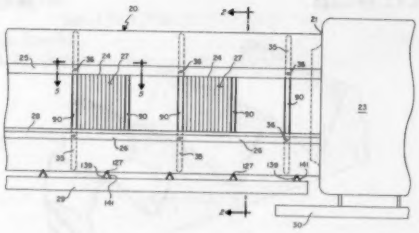
a filter housing including walls defining a plenum chamber and a filter-receiving recess located below said plenum chamber, an inwardly-directed V-shaped bend formed at the intersection between the plenum chamber walls and the recess walls, said V-shaped bend being located inside said recess walls; a filter unit including a body of filter media, a rectangular frame surrounding said filter media, and a first layer of sealing material located on the upper peripheral edge of said filter frame; a removable retainer member for engaging the lower peripheral edge of said filter frame to retain said filter unit in said recess; a second layer of sealing material located between said retainer member and the lower peripheral edge of said filter frame which overlaps said lower peripheral edge of said filter frame and said filter housing walls; each of said recess walls of said filter housing including an outwardly directed flange at the lower edge thereof; and fastening means for detachably connecting said retainer member to said flanges of said filter housing and for forcing said retainer member against said filter unit to compress said first layer of sealing material between said V-shaped bend and the upper peripheral edge of said filter frame and to compress said second layer of sealing material between said retainer member and said lower peripheral edge of said filter frame.

4,178,160

HUMIDIFIER DUCT SYSTEM

Michael Rahman, Winston-Salem, N.C., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 25, 1978, Ser. No. 900,034
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—436 **4 Claims**



1. An eliminator sheet assembly for mounting at an outlet of a duct in a system for distributing humidified air, said assembly comprising:

(a) a housing having a top, a bottom, two upright sidewalls, an inlet end for admitting a flow of humidified air which includes entrained droplets, and an aperture end for discharging this humidified air after removal of a limited part of the entrained droplets, said aperture end being opposite said inlet end;

(b) a plurality of eliminator sheets mounted in parallel in said housing, said eliminator sheets of said plurality being horizontally spaced from one another and being disposed uprightly and generally parallel to the direction of flow of the humidified air from said inlet end to said aperture end, said plurality of sheets forming a bundle having tortuous slow paths between said sheets to channel and act on the humidified air passing through said bundle to remove a limited part of the entrained droplets and to determine the direction of flow of air discharging from said aperture end;

(c) two pairs of spacing members for securing said plurality of eliminator sheets in said housing, a first pair of said spacing members being mounted to extend side-to-side across said inlet end, one member of said first pair being mounted adjacent said top of said housing and the other member of said first pair being mounted adjacent said bottom of said housing, each member of said first pair having recesses equally-spaced therealong for engagement with said eliminator sheets, each one of said recesses of said first pair of spacing members engaging a corresponding one of said eliminator sheets, and a second pair of said spacing members being mounted to extend side-to-side across said aperture end, one member of said second pair being mounted adjacent said top of said housing and the other member of said second pair being mounted adjacent said bottom of said housing, each member of said second pair having recesses equally-spaced therealong for engagement with said eliminator sheets, each one of said recesses of said second pair of spacing members engaging a corresponding one of said eliminator sheets, each eliminator sheet thereby being engaged by a recess on each of said spacing members; and

(d) means for selectively securing one of said pairs of spacing members to said housing at a plurality of lateral positions on said housing, whereby the position of said eliminator sheets relative to said aperture end of said housing is adjustable so that the direction of flow of humidified air from said aperture end can be changed.

4,178,161

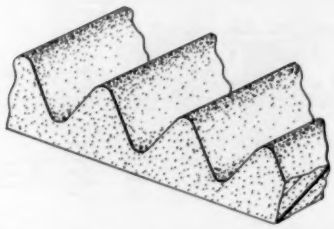
MANUFACTURE OF RIGIDIZED CONVOLUTED FOAM FROM FLEXIBLE POLYURETHANE FOAM AND RESULTANT PRODUCT

Bernard Rudner, Ridgewood; David Reich, Paramus, both of N.J., and Edward Galica, Hialeah, Fla., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 740,952, Nov. 11, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,225

Int. Cl.[2] B01D *39/16;* **B29C** *17/00*

U.S. Cl. 55—524 **24 Claims**



1. A process for the manufacture of a convoluted polyurethane foam self-standing filter which comprises the steps of: (a) passing a sheet of air-permeable flexible polyurethane foam that is capable of being impregnated with a thermosetting resin, said sheet having a thickness of from about 1¼ inches to about 8 inches, through a convoluting machine whereby two unnested sheets of convoluted foam are provided, each of said sheets being convoluted on only one side; (b) nesting said two unnested sheets of convoluted foam; (c) impregnating one of said nested sheets, by means of immersion, reverse-roll coating, or gravure roll coating, from the flat surface of the sheet almost to the closest valley surface of the sheet with a thermosetting melamine, urea, or benzoguanamine resin, and a cross-linker, the combined dry weight of said thermosetting resin and said cross-linker after reaction being from about 10 percent to about 300 percent of the dry weight of said polyurethane foam and being an amount to not appreciably impair said foam permeability and to increase the rigidity of said polyurethane foam sufficiently that said unnested sheet will be self-standing; (d) reacting said thermosetting resin and said cross-linker without separating said nested sheets; (e) repeating steps (c) and (d) on the other of said nested sheets; and, (f) separating said nested sheets, thereby providing convoluted polyurethane foam which is rigid enough to be self-standing.

12. The product of the process of claim **1**.

4,178,162

BUSHING FOR APPARATUS FOR SPINNING GLASS FIBERS

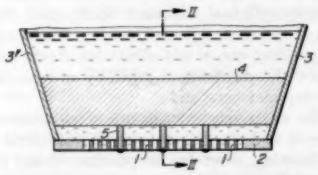
Hiroaki Shono; Shinzo Ishikawa; Isao Wakasa, and Miyako Adachi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 810,284, Jun. 27, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 963,145

Claims priority, application Japan, Jul. 7, 1976, 51-80724

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—1 **8 Claims**



1. A bushing for a glass fiber spinning apparatus, having at its bottom an orifice plate provided with a great number of orifices consisting of plain holes arranged so densely that molten glass cones associated with the respective orifices tend to join, so as to cause a flooding condition at the downside of said orifice plate, said bushing further comprising at least one beam member disposed in said bushing and connected at both ends to the opposing walls of said bushing, each such beam member extending in parallel with and spaced from said orifice plate, and at least one rod member affixed at one end to one such beam member and affixed at the other end to said orifice plate, each such rod member extending substantially perpendicularly to said orifice plate, each such rod member having a diameter substantially equal to the diameter of one of said plain holes.

4,178,163

METHOD FOR THE MANUFACTURE OF FOAMED GLASS

Claus Wüstefeld, Panoramaweg 17, D 7035 Waldenbuch, Fed. Rep. of Germany

Continuation of Ser. No. 692,571, Jun. 2, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,950

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2524981; Aug. 5, 1975, 2534874; Feb. 14, 1976, 2606049; May 15, 1976, 2621688

Int. Cl.[2] C03B *19/08*

U.S. Cl. 65—22 **20 Claims**

1. In a method for the manufacture of foamed glass, the improvement comprising the steps of:

providing a mixture of a finely divided glass and a bonding agent in a weight ratio of glass to bonding agent of 100 parts glass to 5–10 parts bonding agent, the bonding agent being an agent selected from the group of (1) the aqueous solutions of the oxygen acids of beryllium, boror, aluminum, silicon, germanium, arsenic, antimony, tellurium, polonium, astatine and phosphorus, and (2) the aqueous solutions of the salts formed by said oxygen acids neutralized with basic oxides, or basic hydroxides of beryllium, boron, aluminum, silicon, germanium, arsenic, antimony, tellurium, polonium, astatine and of the transition metals having a variable oxidation number;

drying the mixture at a temperature from 20° to 600° C. to thereby transform the bonding agent into a gel having water bound thereto; and

heating the dried mixture to a temperature from 800° to 1,000° C. to thereby melt the mixture and release the bound water from the gel, the released water forming a vaporous cellulating agent which effects the foaming of the molten glass, whereby the molten glass is foamed.

4,178,164

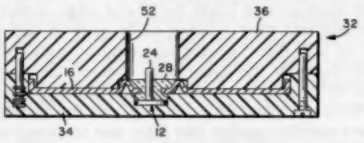
METHOD FOR MAKING A GLASS-TO-METAL SEAL FOR ELECTRO CHEMICAL CELLS

John J. Decker, and Donald J. Kantner, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 905,090, May 11, 1978. This application Oct. 20, 1978, Ser. No. 955,090

Int. Cl.[2] C03C *27/02*

U.S. Cl. 65—59 R **2 Claims**



1. In the method of forming a glass-to-metal seal for electrochemical cell terminals the steps comprising: placing in a carbon female mold half a metal terminal pin which is substantially tack shaped with its head fitted into a depression in said

female mold; placing an apertured metal plate in a suitable depression in said female mold half, said apertured metal plate having a relief ring formed therein surrounding said aperture and spaced therefrom so that the area of said metal plate adjacent said aperture is planar, said planar area being spaced from said tack head and with the upright portion of said tack projecting through said aperture; placing a male mold half on said plate, said male mold half containing a bore of a size to conform to the diameter of said relief ring and being aligned therewith; placing in said bore a sealing material collect containing a central hole to receive said upright portion of said tack; placing a piston in said bore; and heating said mold and contained parts while applying a force to said piston to cause said sealing material to flow about said upright portion of said tack, through said aperture and to fill the space between said planar area and said head and to bond to said head.

4,178,165

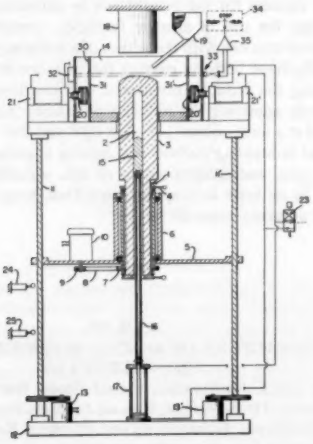
APPARATUS FOR MANUFACTURING HOLLOW AND SOLID INGOTS

Lothar Jung, 31 Lurline Dr., Millington, N.J. 07946

Division of Ser. No. 703,919, Jul. 9, 1976, Pat. No. 4,102,663. This application Jan. 10, 1978, Ser. No. 868,433

Int. Cl.[2] **C03B** *23/20, 19/06;* **B23K** *9/00*

U.S. Cl. 65—144 **7 Claims**



1. An apparatus suitable for the production of a cylindrical ingot from a melt of an ingot material, comprising:

(a) a heating chamber defined by vertical wall means;

(b) a support, vertically movable through said heating chamber, for holding the ingot in a vertical position, said support having an upper surface for deposition of the melt;

(c) a heat source for said heating chamber, said heat source being vertically positioned above said movable support;

(d) means for feeding the ingot material into the heating chamber, initially onto the upper surface of the support and subsequently onto the upper surface of the ingot as the ingot is formed; and

(e) at least one forming tool for shaping the melt to form the vertical cylindrical surface of the ingot, said forming tool being mounted for reciprocating movement in a horizontal plane, through openings in said vertical wall means and into and out of contact with the melt.

4,178,166

4,5-DICHLORO-IMIDAZOLE DERIVATIVES AND THEIR USE AS PLANT PROTECTION AGENTS

Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

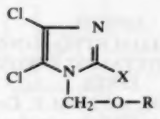
Filed Sep. 21, 1977, Ser. No. 835,095

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646144

Int. Cl.[2] **C07D** *233/68;* **A01N** *9/22*

U.S. Cl. 71—92 **17 Claims**

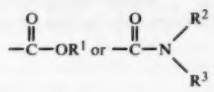
1. A 4,5-dichloro-imidazole derivative of the formula



(I)

in which

X represents a



in which

R^1 represents straight or branched alkyl with 1 to 6 carbon atoms or straight or branched alkenyl or alkynyl, each with up to 6 carbon atoms, which radicals can be carrying one or more substituents selected from halogen, alkoxy with 1 to 6 carbon atoms and alkylmercapto with 1 to 6 carbon atoms,

R^2 represents hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms or the formyl group,

R^3 represents hydrogen, alkyl with 1 to 8 carbon atoms or alkenyl or alkynyl each with up to 8 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from alkoxy with 1 to 4 carbon atoms and alkylmercapto with 1 to 4 carbon atoms, or

R^2 and R^3 conjointly with the adjoining nitrogen atom form a heterocyclic ring selected from pyrrolidinyl, piperidinyl and hexamethyleneimidinyl; and

R represents alkyl with 1 to 12 carbon atoms or alkenyl or alkynyl each with up to 12 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from halogen, alkoxy with 1 to 6 carbon atoms, and alkylmercapto with 1 to 6 carbon atoms.

4,178,167

HERBICIDAL N-(HALOACETYL)-N-(N'-METHYLENEPYRROLIDONYL)-2-ALKOXYANILINES USEFUL AS HERBICIDES

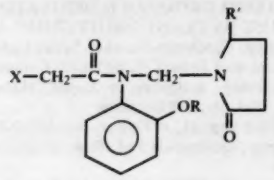
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 807,066, Jun. 16, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,146

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 71—95 **1 Claim**

1. A method of controlling grassy weeds which consists essentially of applying thereto a herbicidally effective amount of N-haloacetyl-N-(N'-methylenepyrrolidonyl)-2-alkoxyaniline compounds of the formula:



where R is alkyl of 1–6 carbon atoms, R′ is hydrogen or lower alkyl of 1–3 carbon atoms, and X is chloro, bromo or iodo.

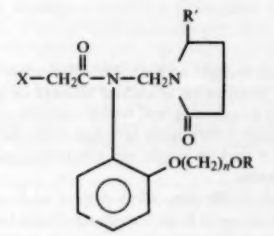
4,178,168

HERBICIDAL N-(HALOACETYL)-N-(N-METHYLENE PYRROLIDONYL)-2-OXYALKYLENEOXYALKYLANILINES

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,569
Int. Cl.[2] C07D *207/26;* **A01N** *9/22*
U.S. Cl. 71—95 **6 Claims**

1. Herbicidal N-(haloacetyl)-N-(N′-methylene-pyrrolidonyl)-2-oxyalkyleneoxyalkylaniline compounds having the formula:



where
n is 1–3,
R is alkyl of 1–3 carbon atoms,
R′ is hydrogen or alkyl of 1–3 carbon atoms, and,
X is chloro or bromo.

6. A herbicidal composition of matter comprising:
a. a herbicidally effective amount of a compound of claim 1; and
b. an inert carrier.

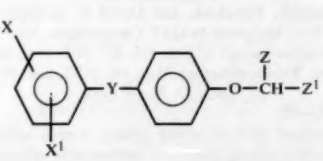
4,178,169

DIPHENYL SULFIDE, SULFOXIDE AND SULFONE PLANT GROWTH REGULATORS

Robert H. Meisinger, Glen Ellyn, Ill., and Pyung K. Yu, Miami, Fla., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 12, 1978, Ser. No. 905,314
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—98 **15 Claims**

1. A method for regulating plant growth which comprises applying to a plant, to plant seeds, or to the locus of a plant an effective amount of a compound of the formula



wherein
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a nitro group,
X^1 is a hydrogen atom, a halogen atom, a trifluoromethyl group, a cyano group, a carbamoyl group, a methyl group, a methoxy group, a (C_1–C_4 alkoxy carbonyl group, a methylcarbonyl group, a methanesulfonyl group, or an amino group,
Y is a group of the formula —S—, —SO—, or —SO_2,
Z is a hydrogen atom or a (C_1–C_4)alkyl group, and
Z^1 is a carboxy group, or an agronomically acceptable salt thereof, a cyano group, or a group of the formula —COR, wherein
R is a (C_1–C_{12})alkoxy group, a (C_7–C_{12})aralkoxy group, a (C_1–C_6)alkoxy (C_1–C_6)alkoxy group, a (C_3–C_5)alkenoxy group, an amino group, a (C_1–C_4)alkylamino group, or a di(C_1–C_4)alkylamino group.

4,178,170

PROCESS FOR THE PRODUCTION OF CARBURIZED SPONGE IRON BRIQUETTES

Italo Iacotti, and Edoardo Pasero, both of Rome, Italy, assignors to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A., Rome, Italy

Continuation of Ser. No. 818,834, Jul. 25, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 914,906
Claims priority, application Italy, Aug. 4, 1976, 818834 A/76
Int. Cl.[2] C21C *5/52*
U.S. Cl. 75—3 **3 Claims**

1. A process for the production of carburized iron sponge briquettes for use in electric furnaces, comprising reducing powdered iron ore with the action of a reducing gas in a plurality of fluidized beds by passing the iron ore from bed to bed, removing the reduced powdered iron ore from the last bed, intimately admixing the reduced powdered iron ore from the last bed at a temperature between 600° and 700° C. with solid material containing carbon and having a grain size not more than 1 mm. and a low content of ash, volatile materials and sulfur, in an inert atmosphere, and then briquetting the intimately admixed material.

4,178,171

MANUFACTURE OF ACICULAR FERROMAGNETIC IRON PARTICLES

Werner Steck, Mutterstadt; Rudolf Brodt, Weinheim; Wilhelm Sarnecki, Limburgerhof; Helmut Jakusch, Frankenthal; Manfred Ohlinger, Frankenthal, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,508
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714588
Int. Cl.[2] B22F *9/00*
U.S. Cl. 75—0.5 AA **5 Claims**

1. A process for the manufacture of acicular ferromagnetic iron particles, which process comprises reducing an acicular iron(III) oxide hydroxide which carries on the surface of its particles a compound of calcium, strontium or barium and a monobasic, dibasic or tribasic aliphatic carboxylic acid of up to 6 carbon atoms or a chelate of calcium, strontium or barium and an organic compound containing at least two groups capable of chelating a calcium, strontium or barium cation, the reduction being carried out with hydrogen at from 275° to 380° C. and the acicular iron(III) oxide hydroxide having a length-to-width ratio of at least 15:1 and consisting of at least 70% by weight of lepidocrocite.

4,178,172

PROCESS FOR THE PRODUCTION OF EXTRA FINE COBALT POWDER

Heikki A. Tiitinen, Ulvila; Jussi K. Rastas, Pori; Matti J. Hamalainen, Kokkola, and Tom O. Niemi, Oja, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 3, 1978, Ser. No. 921,365

Claims priority, application Finland, Jul. 15, 1977, 2209/77

Int. Cl.[2] C22B *23/02*

U.S. Cl. 75—0.5 BA 8 Claims

1. A process for the production of extra fine cobalt powder, comprising pyrolysing a cobalt(III)hexammine salt directly into its oxide, and then reducing the oxide to extra fine cobalt powder.

4,178,173

PROCESS FOR PRODUCING STAINLESS STEELS

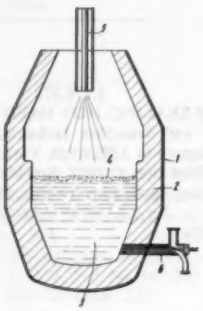
Helmut Gorges; Heinrich Brod; Wilfried Pulvermacher, all of Bochum; Wolfgang Rübens, Witten-Stockum, and Otto Fischer, Bochum, all of Fed. Rep. of Germany, assignors to Fried. Krupp Hüttenwerke Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,598

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1977, 2737832

Int. Cl.[2] C21C *5/32, 5/34*

U.S. Cl. 75—60 2 Claims



1. In a process for producing stainless steel of very low carbon content from a steel melt containing chromium or chromium nickel having a higher carbon content in a converter which has at least one blast nozzle below the molten steel bath level and at least one blast lance above the bath level wherein:

A. In a first refining phase oxygen is supplied to the steel melt through said blast lance and inert gas is supplied through said blast nozzle; and

B. In a succeeding refining phase oxygen in admixture with inert gas is supplied to said bath through said blast nozzle and the proportion of oxygen supplied is reduced in relationship to the proportion of inert gas

with the decreasing carbon content in the molten steel, the improvement permitting a decrease in the amount of inert gas supplied during said first refining phase without significantly increasing the refining time, which improvement comprises employing as at least one of said nozzles one having an axially movable bar within the passageway of said nozzle, said bar being:

1. Extended through said nozzle passageway to the mouth of said nozzle during said first refining phase; and

2. Said bar being withdrawn from said mouth during the successive refining phase, whereby the amount of gas passing through said nozzle during said first refining phase is reduced and the amount of gas passing through said nozzle during the successive refining phase is increased.

4,178,174

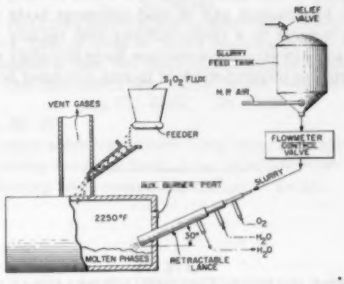
DIRECT PRODUCTION OF COPPER METAL

Charles Arentzen, Tucson, Ariz., assignor to The Anaconda Company, Denver, Colo.

Continuation-in-part of Ser. No. 827,359, Aug. 24, 1977, Pat. No. 4,148,630. This application Dec. 19, 1978, Ser. No. 971,084

Int. Cl.[2] C22B *15/00*

U.S. Cl. 75—74 5 Claims



1. A process for the direct production of copper metal by directing an aqueous slurry of cupriferous material into a molten bath of cupriferous material at a temperature of about 2100° F. to 2400° F., wherein neither the cupriferous material of the slurry nor the cupriferous bath contain sufficient sulfides to maintain the bath temperature by oxidation of the sulfides, which comprises:

(a) incorporating in the slurry of cupriferous material a carbonaceous fuel;

(b) injecting oxygen-containing gas and the fuel-containing cupriferous slurry into the molten bath in the form of a high-velocity stream of the gas and slurry directed at the surface of the bath at an angle of from about 20° to 40° from the horizontal; and

(c) separately withdrawing the resulting slag and metallic copper from the bath, the proportion of slurry and volume of oxygen injected being adjusted with respect to the energy supplied by the fuel to establish and maintain operation at a temperature range of from about 2100° to 2400° F.

4,178,175

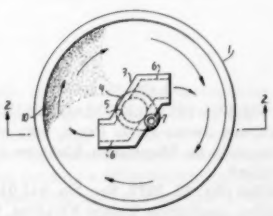
METHOD FOR AGITATING A BATH OF MELTED METAL FOR TREATING THE SAME

Kiichi Narita, Kobe; Takasuke Mori, Ashiya, and Takamichi Ito, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 368,283, Jun. 8, 1973, abandoned. This application Mar. 31, 1978, Ser. No. 892,417

Int. Cl.[2] C21C *7/00*

U.S. Cl. 75—93 E 1 Claim



1. A method of agitating a bath of melted metal for treating the same by defining a columnar body of the melted metal in said bath being hydrostatically communicated with said bath at the lower end portion thereof, mixing a gas with said columnar body to cause said body to have a reduced apparent specific

gravity as compared with the remaining body of said bath, and pouring melted metal forming the uppermost region of said columnar body onto the free surface of said bath from the upper side thereof, characterized by changing continuously the position from which said melted metal is poured on said free surface of said bath by relatively moving the flow of said melted metal with respect to said free surface and wherein said melted metal forming the upper-most region of said columnar body is poured into said bath at a location radially removed from the longitudinal axis of said columnar body and in a direction tangent to a circle defining said radially removed location so as to generate a reaction force including a component exerting a rotating moment to said columnar body.

4,178,176

RECOVERY OF IRON AND TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 19, 1978, Ser. No. 925,901
Int. Cl.[2] C21B *15/00*; C01G *23/04*
U.S. Cl. 75—101 R **9 Claims**

1. A process for the recovery of iron values and titanium values from ilmenite which comprises the steps of:
(a) crushing said ilmenite;
(b) subjecting said crushed ilmenite to a reductive roast at a temperature of from about 600° to about 1000° C. in the presence of hydrogen, carbon monoxide, or a mixture of carbon monoxide and hydrogen;
(c) leaching the resultant reduced ilmenite with a leach solution comprising hydrogen chloride to form iron chlorides and titanium chlorides;
(d) removing insoluble gangue;
(e) cooling the soluble metal chlorides sufficiently to crystallize the iron chloride;
(f) separating the solid iron halide from the soluble titanium chloride;
(g) reducing a major portion of said iron chloride to form metallic iron hydrogen chloride, and recovering the metallic iron;
(h) oxidizing the other portion of said iron chloride to form ferric oxide;
(i) contacting said soluble titanium chloride with said ferric oxide to precipitate solid titanium dioxide; and
(j) separating and recovering said titanium dioxide.

4,178,177

STIRRING MEANS TO MAKE MAGNESIUM ALLOYS

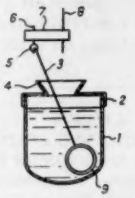
Peter Roebuck, and James H. T. Petch, both of Manchester, England, assignors to Magnesium Elektron Limited, Manchester, England

Filed Oct. 13, 1977, Ser. No. 842,014
Claims priority, application United Kingdom, Oct. 13, 1976, 42562/76
Int. Cl.[2] C22C *23/00, 1/02*
U.S. Cl. 75—135 **9 Claims**

1. A method of stirring a fluid mass of molten metal contained in a circular curved bottom vessel comprising the steps of

rotating a curved loop-shaped paddle in the fluid about a substantially center axis of the loop,

simultaneously rotating said loop-shaped paddle in an orbit around a fixed axis causing said center axis of the loop to orbitally rotate about said fixed axis,



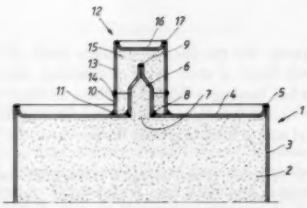
passing said loop close to substantially the whole of the curved bottom of the vessel and traversing substantially all the fluid mass with said curved loop by the combination rotation about said center and fixed axes.

4,178,178

METHOD OF SEALING HOT ISOSTATIC CONTAINERS

Tore Garvare, and Sven-Erik Isaksson, both of Robertsfors, Sweden, assignors to ASEA AB, Vasteras, Sweden

Filed Dec. 1, 1977, Ser. No. 856,535
Claims priority, application Sweden, Dec. 1, 1976, 7613445
Int. Cl.[2] B22F *3/00, 3/16*
U.S. Cl. 75—226 **5 Claims**



1. In a method for manufacturing solid bodies by preforming a quantity of powder and enclosing the powder preform thus produced in a casing provided with an evacuation nozzle, preheating the powder preform and degassing the same by evacuating said casing through said nozzle, and then isostatically hot pressing the powder preform by subjecting the same simultaneously to an elevated all encompassing gas pressure and a high temperature whereby the powder preform is sintered and compressed to produce a high density solid body, the improvement comprising conducting, after said degassing step and prior to said hot pressing stel, the steps of:

sealing said nozzle;

partially surrounding said sealed nozzle with a hood element so as to define a space between said nozzle and said hood element;

filling the space with a filling material and
closing the hood element about the nozzle to yield a gas-tight hood.

4,178,179

ELECTROPHOTOGRAPHIC MASTER CONVERSION SOLUTION

David A. Wheatland, Brunswick, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 743,592, Nov. 22, 1976, abandoned, which is a continuation of Ser. No. 600,226, Jul. 30, 1975, Pat. No. 4,007,126. This application Jun. 1, 1978, Ser. No. 911,453
Int. Cl.[2] G03C *5/40;* **G03F** *7/02*
U.S. Cl. 430—49 **7 Claims**

1. A method of converting electrophotographic master plates having a zinc oxide containing coating by enhancing the hydrophilic properties of non-imaged portions of the electrophotographic master plate; comprising contacting the master plate with an acidic, aqueous conversion solution consisting essentially of phosphate ions and an active amount of a compound capable of forming an insoluble hydrophilic chelate with zinc ions in the presence of phosphate ions, said compound selected from the group consisting of triethylenetetramine and ethylenediamine.

4,178,180

COPPER PHYSICAL DEVELOPMENT USING HETEROCYCLIC LIGAND COPPER (I) COMPLEXES

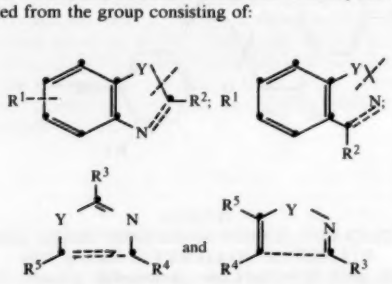
Richard S. Vinal, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 833,622, Sep. 15, 1977. This application Dec. 8, 1978, Ser. No. 967,559
Int. Cl.[2] G03C *5/24*
U.S. Cl. 430—417 **14 Claims**

1. A physical developer formulation comprising:
(a) a solvent;
(b) a copper(I) complex represented by the formula

$$L(CuX)_m$$

wherein L is a monodentate or bidentate heterocyclic ligand selected from the group consisting of:



wherein Y is oxygen or sulfur; R^1 is alkyl having from 1 to 20 carbon atoms or aryl having from 6 to 20 carbon atoms; R^2 through R^5 are independently selected from the group consisting of hydrogen, alkyl having from 1 to 20 carbon atoms, and aryl having from 6 to 20 carbon atoms; with the proviso that at least one of R^3 through $R^5$is hydrogen;

X is an anion; and
m is the integer of 1 or 2; and
(c) an organic ligand for copper(II).

4,178,181

INTERFERENCE FILM PHOTOGRAPHY

George M. Sawyer, 3435 W. 110th St., Inglewood, Calif. 90303

Continuation of Ser. No. 544,275, Apr. 21, 1966, abandoned. This application Sep. 14, 1970, Ser. No. 72,197
Int. Cl.[2] G03C *1/76, 7/00*
U.S. Cl. 96—67 **2 Claims**

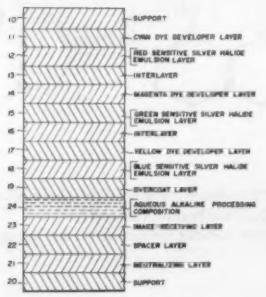
1. A photo-sensitive element comprising a transparent base, a silver halide emulsion layer and a reflecting layer thereover said reflecting layer comprising indium or gallium.

4,178,182

COLOR DIFFUSION-TRANSFER PHOTOGRAPHIC ELEMENT

Motohiko Tsubota; Shinji Sakaguchi, and Nobuo Tsuji, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd, Kanagawa, Japan and National Patent Development Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,016
Claims priority, application Japan, Aug. 24, 1973, 48-94330
Int. Cl.[2] G03C *1/40, 1/76, 7/00, 5/54*
U.S. Cl. 96—73 **37 Claims**



1. In a color diffusion transfer photographic product comprising a support carrying at least two dye image-forming units, each comprising a selectively sensitized silver halide emulsion layer associated therewith a dye image forming material capable of forming a diffusible dye contained in either said silver halide emulsion layer or a contiguous layer, an interlayer between said two dye image-forming units and an overcoat layer on the dye image-forming unit furthest from said support, the improvement in which at least one selected from the group consisting of said interlayer and said overcoat layer comprises a polymer of a monoacrylate or monomethacrylate of an aliphatic polyhydric alcohol.

4,178,183

THIAZOLYL COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Samuel J. Ciurca, Jr., Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,621
Int. Cl.[2] G03C *1/76, 7/24*
U.S. Cl. 430—553 **19 Claims**

10. A photographic element adapted to form a multicolor photographic image and an integral infrared absorbing dye sound track capable of producing a maximum density in excess of 1 throughout the spectral region of from 750 to 850 nm comprising

a transparent film support,

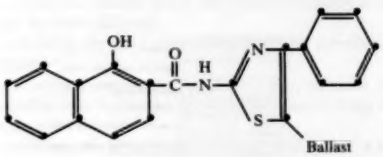
a first layer unit coated on said film support comprising a gelatino-silver halide emulsion layer having a peak sensitivity to a portion of the spectrum within the blue region at a wavelength shorter than 470 nm and containing a yellow dye-forming coupler,

a second layer unit coated over said first layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity to the red portion of the spectrum and containing a cyan dye-forming coupler,

a third layer unit coated over said second layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity to the green portion of the spectrum and containing a magenta dye-forming coupler, and

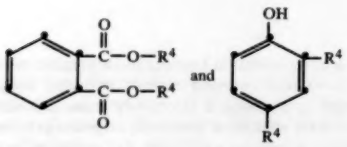
a fourth layer unit coated over said third layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity within the 470 to 500 nm region of the spectrum and containing coupler solvent particles comprised of a combination, capable of permitting the formation of a microcrystalline dye, of

an infrared absorbing dye-forming coupler in a concentration of from 0.65 to 1.05 grams per square meter of the formula



wherein Ballast is a straight-chain alkyl group of from 10 to 20 carbon atoms and

a coupler solvent chosen from the group consisting of



wherein R^4 is alkyl of from 1 to 6 carbon atoms, said coupler and said coupler solvent being present in said particles in a ratio of from 4:1 to 1:1.

4,178,184

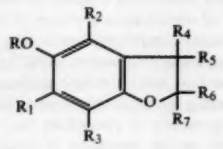
COLOR PHOTOGRAPHIC MATERIALS CONTAINING DYE-FADING INHIBITORS

Masahiko Taguchi; Katsuo Mogaki, and Syun Takada, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

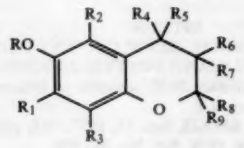
Filed Oct. 18, 1977, Ser. No. 843,261
Claims priority, application Japan, Oct. 23, 1976, 51-127427
Int. Cl.[2] G03C *1/76, 1/06, 1/40*
U.S. Cl. 430—503 **9 Claims**

1. A color photosensitive material comprising a support and a silver halide photosensitive layer, said material containing a first compound represented by formulas (Ia), (Ib), or (c) in combination with a second compound represented by formula (II)

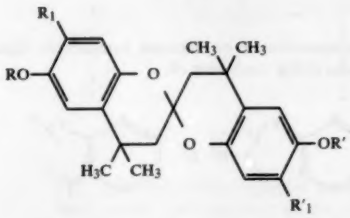
Formula (Ia)



Formula (Ib)

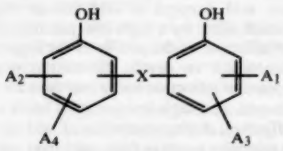


Formula (Ic)



wherein R, R′ and R'_1, individually represent an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, or a heterocyclic ring; and R_4, R_5, R_6, R_7, R_8 and R_9 individually represent hydrogen, an alkyl group, an alkoxy group, an alkylthio group, an alkenyl group, an alkenyloxy group, an aryl group, an aryloxy group, an amino group or a heterocyclic

group selected from piperadine, morpholine, imidazoline, thiazoline, pyridine, pyrimidine, and triazine; provided that R_8 and R_9 can cooperatively be cyclized to form a cyclohexane ring which may be substituted with alkyl;



Formula (II)

wherein A_1, A_2, A_3 and A_4 are individually alkyl having 1–18 carbon atoms, the total number of carbon atoms of A_1, A_2, A_3 and A_4 being not more than 32; and X is a simple bond, oxygen, sulfur, or

in which A_5 is hydrogen or alkyl having 1–10 carbon atoms and n is an integer of 1–3.

4,178,185
Patent Not Issued For This Number

4,178,186
RESIN FOR COATINGS

Seimei Yasui, Ibaraki, and Minoru Hino, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 5, 1976, Ser. No. 655,530
Claims priority, application Japan, Feb. 7, 1975, 50/16634
Int. Cl.[2] C09D *11/02;* **C08F** *8/46*
U.S. Cl. 106—20 **12 Claims**

1. A resin for coatings comprising a modified polymer consisting of an adduct of at least one liquid conjugated diolefinic polymer having a number average molecular weight of 150 to 3,000, a viscosity of 2 to 5,000 cps at 30° C., and at least 50% of cis-1,4 structure with at least one α,β-unsaturated dicarboxylic acid or anhydride thereof, wherein the carboxyl group or the carboxylic anhydride group is imidated by reacting with at least one primary amine having 1 to 27 carbon atoms and thereby the total amine value of the resulting modified polymer is made not more than 3.

4,178,187
MIXED OXIDE COMPOUND $NDALO_3$ FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 775,758, Mar. 9, 1977, Pat. No. 4,108,676. This application Jan. 5, 1978, Ser. No. 867,191
Int. Cl.[2] B28B *7/34;* **C04B** *35/44, 35/50;* **C01F** *17/00*
U.S. Cl. 106—38.9 **2 Claims**

1. A sintered ceramic core suitable for use in the casting and directional solidification of advanced superalloy materials consisting essentially of

a mixed oxide compound material $NdAlO_3$,

having a porosity content which is from about 10 percent by volume to about 70 percent by volume, at least 10 percent of the porosity content is interconnected, and

the $NdAlO_3$ mixed oxide compound material is leachable in a molten salt bath which is one selected from the group consisting of M_3AlF_6, M_3AlF_6+MF, $M_3AlF_6+M'F_2$ and M_3AlF_6+MCl wherein

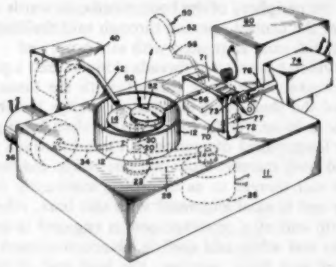
M is Li, Na or K, and

M' is Mg, Ca, Ba or Sr.

4,178,188
METHOD FOR CLEANING WORKPIECES BY ULTRASONIC ENERGY

Jean G. M. Dussault, Naugatuck; Robert A. Geckle, Newtown, and William L. Puskas, Trumbull, all of Conn., assignors to Branson Ultrasonics Corporation, New Canaan, Conn.

Continuation of Ser. No. 833,024, Sep. 14, 1977, abandoned, which is a division of Ser. No. 735,601, Oct. 26, 1976, Pat. No. 4,064,885. This application Aug. 7, 1978, Ser. No. 931,461
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—1 **11 Claims**



1. The method of cleaning a workpiece comprising the steps of:

disposing a workpiece on a support in a manner for providing an exposed side of the workpiece;

rotating said support to cause the workpiece to undergo rotation about an axis intersecting said exposed side at a substantially perpendicular angle;

disposing an electroacoustic transducer spaced from the exposed side of the workpiece to form a gap between the transducer and the exposed side;

flooding the exposed side of the workpiece with a film of solvent flowing across the exposed side through the gap between the transducer and the exposed side;

applying ultrasonic energy emitted by the transducer to the flowing film of solvent to cause cavitation therein for effecting cleaning of the exposed side of the workpiece while the workpiece undergoes rotation;

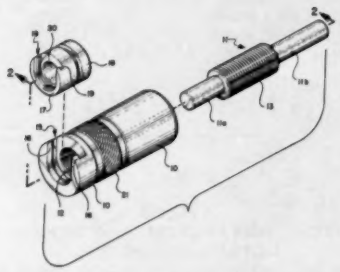
ceasing flooding of the exposed side of the workpiece, and subsequently rotating the support at a rotational speed sufficient to effect solvent removal from the exposed side by centrifugal force.

4,178,189

APPARATUS AND METHOD FOR CLEANING AND POLISHING CARTRIDGE CASES

Angelo J. Mancini, P.O. Box 545, and Ronald W. Galloway, Rte. 1, both of Afton, Wyo. 83110

Filed Jun. 12, 1978, Ser. No. 914,206
Int. Cl.[2] B08B *7/100*
U.S. Cl. 134—6 **5 Claims**



1. (Amended) A tool for mounting a cartridge case to a drill chuck for rotating the cartridge case about its longitudinal axis, said tool comprising:

a universal shellholder;

a body member having a bore extending axially from one end thereof to the other, with at least a portion of the bore being internally threaded;

an undercut slot at one end of said body member extending from the periphery of the body member radially inwardly to said bore, said slot being adapted to receive the flanged end of said universal shellholder in sliding movement from the periphery of the body member towards the bore, so that the central opening through said shellholder is in substantial axial alignment with said bore; and

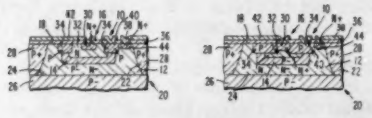
a shaft which has external threads along at least a portion of the longitudinal surface thereof, with the threaded portion of the shaft being adapted to engage the threads of the bore in said body member, said shaft having a sufficient longitudinal dimension to extend through the bore in said body member from said one end to and beyond the other end thereof so as to project outwardly from said other end in axial alignment with said bore, where when the rim end of a cartridge case is engaged in said shellholder and when said shaft is advanced toward said one end of said body member, the lead end of said shaft extends through the opening in said shellholder and contacts the end of the cartridge case, thereby binding the body member, shaft, shellholder, and cartridge case in locked engagement as a rigid unit, with the portion of the shaft projecting from the body member being adapted for engagement with a drill chuck.

4,178,190

METHOD OF MAKING A BIPOLAR TRANSISTOR WITH HIGH-LOW EMITTER IMPURITY CONCENTRATION

Murray A. Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 799,722, May 23, 1977, Pat. No. 4,136,353, which is a continuation-in-part of Ser. No. 591,955, Jun. 30, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 950,068
Int. Cl.[2] H01L *29/72, 29/02, 21/00*
U.S. Cl. 148—1.5 **7 Claims**



1. In a method of making a semiconductor device including forming a collector region of one type conductivity, forming a base region of the opposite type conductivity adjacent to said collector region, and forming an emitter region adjacent to said base region away from said collector region and of said one type conductivity, said emitter region having a depth greater than about 0.5 micrometers and having a relatively high-impurity-concentration portion separated from said base region by a significantly lower-impurity-concentration portion disposed therebetween, said portions of said emitter region being separated from each other by a high-low junction characterized by a point of inflection in the profile of the logarithm of the impurity-concentration vs. depth, the emitter doping concentration at said point of inflection being less than 2×10^{18} atoms per cubic centimeter, said high-low junction being sufficient in depth to be effective, during operation of said device, as a barrier to reflect minority carriers from said base region, the improvement in said method comprising the step of:

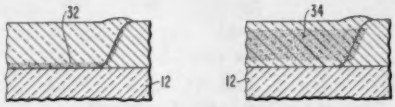
forming a graded impurity concentration in said low-impurity-concentration portion of said emitter region with the lowest-impurity-concentration section thereof being disposed adjacent said base region.

4,178,191

PROCESS OF MAKING A PLANAR MOS SILICON-ON-INSULATING SUBSTRATE DEVICE

Doris W. Flatley, Belle Mead, N.J., assignor to RCA Corp., New York, N.Y.

Filed Aug. 10, 1978, Ser. No. 932,626
Int. Cl.[2] H01L *21/225, 21/263, 11/00*
U.S. Cl. 148—1.5 **8 Claims**



1. In a process of making a planar silicon-on-insulating-substrate device which process includes the steps of forming an etch resistant, oxygen impermeable masking coating on discrete areas of the surface of a layer of silicon on an insulating substrate, and etching the unmasked portions of said silicon layer down to a depth about one-half the thickness of said silicon layer, the improvement comprising:

without removing said masking coating, introducing stabilizing impurities into the surface of the unmasked portions of the silicon layer, and

thereafter thermally oxidizing only the unmasked portions of the silicon layer to convert it to stabilized silicon dioxide in surrounding relation to the remaining masked portions of the silicon layer.

4,178,192

PROMOTION OF SURFACE FILM STABILITY DURING INITIATION OF THERMAL MIGRATION

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,924
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **9 Claims**

1. In the method of moving a melt of metal-rich semiconductor material through a solid body of semiconductor material by thermal gradient zone melting processing comprising the steps of

a. selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure;

b. depositing a layer of metal having the preferred planar crystal structure orientation of one or more physical con-

figurations on the selected surface of the body of semiconductor material;

c. heating the body and the metal deposit to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

d. establishing a unidirectional temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure; and

e. migrating the metal-rich melt though the body along the unidirectional temperature gradient to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one impurity material therein to impart at least one predetermined electrical characteristic thereto;

the improvement in the method of processing which includes

incorporating a wetting agent in the deposited layer of metal to enhance the wettability of the deposited layer with respect to a layer of the oxide of the semiconductor material on the surface of the body on which the metal is deposited and to promote initiation of thermal migration of a melt of the metal of the layer through the body by thermal gradient zone melting processing.

4,178,193

METHOD OF IMPROVING CORROSION RESISTANCE WITH COATING BY FRICTION

Jerome J. Kanter, 12300 Hobart Ave., Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 558,800, Mar. 17, 1975, abandoned. This application May 25, 1977, Ser. No. 800,517

Int. Cl.[2] C23C *17/00*

U.S. Cl. 148—6 **1 Claim**

1. The method of coating a titanium article to improve the corrosion resistance of said titanium article comprising the steps of:

providing a titanium article; and

frictionally applying solid silicon to at least a portion of the surface of said titanium article to form a corrosion resistant coating on the treated portion of said titanium article.

4,178,194

ELECTROLYTIC PICKLING OF SILICON ELECTRICAL STEEL SHEET

Nazzareno Azzerri, via Catullo No. 57, Pomezia (Roma), and Roberto Bruno, via Cassia 1041, Roma, both of Italy

Filed Dec. 18, 1978, Ser. No. 970,109

Claims priority, application Italy, Dec. 16, 1977, 52249 A/77

Int. Cl.[2] H01F *1/04;* B23P *1/00*

U.S. Cl. 148—111 **5 Claims**

1. In a process for the production of silicon electrical steel sheet comprising in sequence the steps of hot rolling a strip of the steel; subjecting the strip to electrolytic pickling in a neutral aqueous medium, with the strip assuming a cathodic and anodic function; subjecting the strip thus pickled to heat treatment; cold rolling the strip; coating the strip with an annealing separator; annealing the strip; and subjecting the strip to final heat treatment; the improvement comprising, during the anodic phase of said electrolytic pickling, imposing on the strip a potential less than +1 V with respect to the standard hydrogen electrode.

4,178,195

SEMICONDUCTOR STRUCTURE

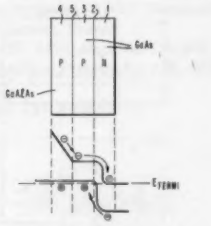
Harold J. Hovel, Katonah, and Jerry M. Woodall, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 744,012, Nov. 22, 1976, Pat. No. 4,122,476. This application Jun. 22, 1978, Ser. No. 918,114

Int. Cl.[2] H01L *21/208*

U.S. Cl. 148—171 **10 Claims**

1. The process of fabrication of a semiconductor structure having epitaxially contiguous regions of first and second semiconductor materials comprising in combination, the steps of contacting a substrate of a first semiconductor material with a melt of a second semiconductor material having the characteristics that the melt is undersaturated at the contacting temperature and that it becomes supersaturated as a result of the presence of said first semiconductor material dissolved into said melt, and separating said substrate and said melt.



4,178,196

METHOD FOR MANUFACTURING AN IMAGE PICKUP TUBE TARGET

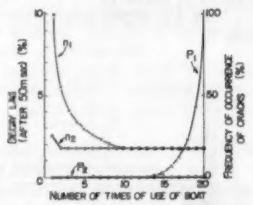
Yasuhiko Nonaka, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed May 22, 1978, Ser. No. 908,286

Claims priority, application Japan, Jul. 1, 1977, 52-77916

Int. Cl.[2] H01L *27/14, 21/06*

U.S. Cl. 148—174 **1 Claim**



1. A method for manufacturing an image pickup tube target having a transparent substrate, a transparent conductive film, an N-type conductive film a Se-As-Te P-type photoconductive film and a porous Sb_2S_3 film formed in sequence one on the other, in which, in evaporating said porous Sb_2S_3 film in a low pressure inert gas, the amount of pre-evaporation of Sb_2S_3 is decreased as the number of times of repetitive use of an evaporation boat increases in which Sb_2S_3 is placed for evaporation, whereby the Sb_2S_3 film having a given porosity is formed.

4,178,197

FORMATION OF EPITAXIAL TUNNELS UTILIZING ORIENTED GROWTH TECHNIQUES

John C. Marinace, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,230

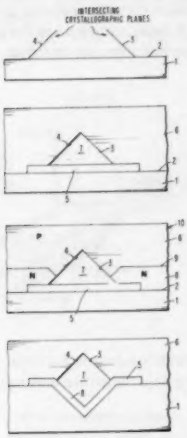
Int. Cl.[2] H01L *21/20, 21/467, 21/76*

U.S. Cl. 148—175 **4 Claims**

1. The process of providing epitaxial tunnels in monocrystalline structures comprising the steps of:

providing a crystalline substrate having a surface thereof with a crystallographic orientation such that there are two

preferential growth crystallographic planes that intersect said substrate surface and intersect each other;



providing a void delineating resist pattern on said substrate and epitaxially growing a crystal of said material along said planes until intersection has taken place.

4,178,198

METHOD AND APPARATUS FOR TREADING TIRES

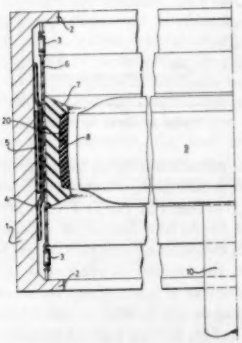
Jan H. F. Kent, St. Martin, Channel Islands, assignor to Kentredder Limited, St. Saviour, Channel Islands

Filed Jan. 31, 1978, Ser. No. 873,864

Claims priority, application United Kingdom, Feb. 7, 1977, 4891/77; Sep. 13, 1977, 38121/77

Int. Cl.[2] B29H *5/02, 5/30*

U.S. Cl. 156—96 **20 Claims**



1. A method of applying a tread band to a tyre carcass comprising the steps of

(a) providing a pre-vulcanised tread band and a continuous annular resilient tread band holder

(b) locating said tread band, whose inner periphery is greater than the outer periphery of a tyre carcass to be treaded, on the inner surface of said tread band holder, said tread band holder being of an adjustable diameter due to its resilient construction,

(c) positioning a tyre carcass adjacent said tread band so that their mid-circumferential planes coincide,

(d) urging the tread band into contact with the tyre carcass by reducing the diameter of the tread band holder, thereby shortening the outer periphery of the tread band and causing a generally uniform circumferential compressive stress to be set up in the tread band, the compressive stress being maintained while the band is bonded to the carcass so that, in the final assembly of tyre carcass and tread band, the outer periphery of the tread band is under compressive stress.

4,178,199

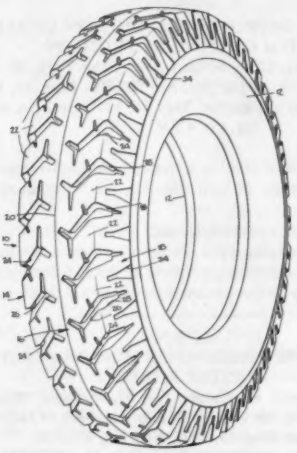
NOISE REDUCTION IN PNEUMATIC TIRES

Seymour A. Lippman, Huntington Woods; Gary P. Stokes, Westland, and Charles M. Chupa, Dearborn Heights, all of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 839,235, Oct. 4, 1977, abandoned, which is a continuation of Ser. No. 673,313, Apr. 5, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,366

Int. Cl.[2] B29H *5/02*

U.S. Cl. 156—110 R **2 Claims**



1. A method of making a pneumatic tire to minimize noise generated by such tire during operation in a preferred speed range comprising the steps of:

(a) determining the resonant frequencies of a specimen tire;

(b) determining, for a plurality of tread pitch sequences, each of which includes a plurality of lugs, the excitation peak frequencies of each such tread pitch sequence, the excitation peak frequencies of each such tread pitch sequence being the frequencies of the strongest excitations which that tread pitch sequence would create upon operation of a tire in the preferred speed range with that tread pitch sequence applied thereto;

(c) comparing the excitation peak frequencies of each such tread pitch sequence with the resonant frequencies of the specimen tire, to determine the degree of coincidence between the excitation peak frequencies of each such tread pitch sequence and the resonant frequencies of the specimen tire;

(d) selecting the tread pitch sequence for which said degree of coincidence is the lowest; and

(e) applying the tread pitch sequence so selected to the tire being made.

4,178,200

PRESSURE ROLL FOR JACKETING STEEL PIPES WITH THERMOPLASTIC STRIP

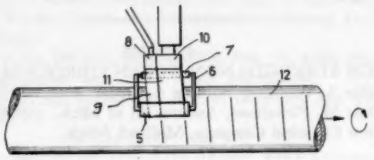
Karl-Heinz Hakert, Mülheim, and Walter Quitmann, Angermund, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,969

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2710705

Int. Cl.[2] B65H *81/00*; B21B *31/08*

U.S. Cl. 156—187 **6 Claims**



1. Pressure roller for forcing a thermoplastic ribbon, strip or the like onto the surface of a rotating and axially moving steel pipe, comprising:

a shaft;

a cylindrical core on the shaft, made of sillicone rubber: and

a jacket on the core, made also of silicone rubber but being softer than the core.

4,178,201

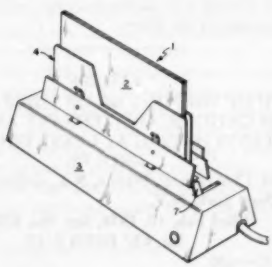
CARRIER FOR HOLDING SHEETS OF MATERIAL FOR USE WITH A THERMAL BINDING MACHINE

John J. Power, Westbury, N.Y.; Raymond H. Van Wagener, Darien, Conn., and Ernest M. Raasch, Fort Lee, N.J., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,686

Int. Cl.[2] B32B *35/00*; C09J *5/00*

U.S. Cl. 156—499 **15 Claims**



1. A carrier for supporting sheets to be bound along one edge of said sheets, said carrier having two side portions and a bottom portion:

(a) said side portions cooperating with said bottom portion for supporting the edges of the sheets being bound proximate the bottom portion and between the side portion;

(b) said bottom portion having an inner surface for supporting glue material placed thereagainst and used in binding the sheets together;

(c) said bottom portion also having an outer surface defined by a material for withstanding the heat when placed adjacent a heat source sufficient to melt the glue material proximate the inner surface; and

(d) said inner surface including a material for withstanding the heat transferred from the outer surface and having the characteristic of allowing the melted glue after cooling to be withdrawn from the inner surface in bound disposition with the sheets.

4,178,202

METHOD AND APPARATUS FOR FACILITATING THE DISPOSAL OF CUTTING LIQUID

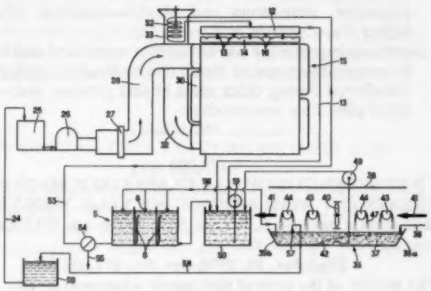
Georges Thomas, Fontenay le Comte, and Henri Nicol, Garancieres, both of France, assignors to SKF Compagnie d'Applications Mechaniques, Clamart, France

Filed Apr. 27, 1977, Ser. No. 791,252

Claims priority, application France, Apr. 28, 1976, 76 12579; Apr. 21, 1977, 77 12100

Int. Cl.[2] B01D *1/14*

U.S. Cl. 159—15 **8 Claims**



1. A method for the disposal of waste cutting liquid consisting essentially of an emulsion of partly soluble oils and water, said method comprising the steps of:

preliminary evaporating a part of water from said liquid in a shallow storage vessel defining a large free surface of said liquid in direct contact with air at ambient temperature,

permitting said liquid to settle for removal of insoluble oils from said liquid by decantation,

removing said insoluble oils from the surface of said settled liquid and delivering them to a treating device for separating the solid residues and tars from the combustible products,

flowing said liquid from the bottom of said settled liquid to the top of an evaporation tower,

causing said liquid to flow through the eavporation tower in a thin trickling stream submitted to a transverse current of hot air maintained at a temperature which will not evaporate the most volatile oily constituents of said liquid, said liquid remaining at a temperature below the evaporation temperature of the most volatile oily constituents thereof, whereby said air is only charged with water vapor and may be directly discharged to the atmosphere,

delivering the liquid collected at the bottom of the evaporating tower to said treating device for separating the solid residues and tars from the combustible products,

burning said combustible products,

and producing said current of hot air from heat produced from burning said combustible products.

4,178,203

METHOD OF INCREASING THE STRENGTH OF WET GLASS FIBER MATS MADE BY THE WET-LAID PROCESS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 24, 1978, Ser. No. 872,002

Int. Cl.[2] D21H *5/18*

U.S. Cl. 162—156 **13 Claims**

1. In the manufacture of glass fiber mat products by the wet-laid process at a high rate of production wherein an aqueous dispersion of glass fibers which contains a surfactant dis-

persant is formed from bundles of glass fibers of about ¼ to 3 inches in length and tertiary amine oxide or cationic quaternary ammonium dispersant compound at a concentration of about 5–500 ppm and at a fiber consistency of about 0.001 to 3%, which dispersion is passed through a matforming screen to form a freshly-prepared wet-mat of said fibers, the improvement which comprises:

applying to said freshly-prepared wet-mat an anionic surfactant selected from the group consisting of (1) an anionic surfactant having at least (a) a hydrophobic segment containing from 8 to 30 carbon atoms selected from the groups consisting of alkyl, aryl, alkylaryl, substituted alkyl, and substituted alkenyl groups, said groups being straight or branched chain, saturated or unsaturated, and (b) an anionic segment selected from the groups consisting of carboxy, sulfate ester, phosphate ester, sulfonic acid and phosphonic acid, or (2) a soap selected from sodium, potassium, ammonium and alkylolammonium salts of higher C_{10}–C_{20} fatty acids,

thereby to improve the wet-strength properties of said freshly-prepared wet-mat so that it can be readily handled and transferred during other steps in said process, into a finished glass fiber mat product.

4,178,204

WET-STRENGTH OF WET GLASS FIBER MATS BY TREATMENT WITH ANIONIC POLYELECTROLYTES

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

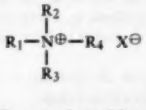
Filed Jan. 24, 1978, Ser. No. 872,000

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] D21H *5/18*

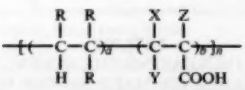
U.S. Cl. 162—156 **20 Claims**

1. In the manufacture of glass fiber mat products by the wet-laid process at a high rate of production wherein an aqueous dispersion of individual glass fibers is formed from bundles of glass fibers of about ¼ to 3 inches in length and an amine oxide dispersant or cationic quaternary ammonium dispersant compound having the formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, straight chain or branched, or two or more form a cyclic group, saturated or unsaturated, substituted or unsubstituted, at least two of said radicals containing at least 10 carbon atoms each, being the same or different, the sum of the carbon atoms in R_1, R_2, R_3 and R_4 being at least 22 and less than about 48, and X is an anion at a concentration of about 5–500 ppm and at a fiber consistency of about 0.001 to 3%, which dispersion is passed through a mat-forming screen to form a freshly-prepared wet-mat of said fibers, the improvement which comprises:

applying to said freshly-prepared wet mat an anionic polyelectrolyte having the structural formula:



wherein each R can be the same or different and is selected from the group consisting of hydrogen, lower alkoxy, hydroxy, lower alkylcarbonyloxy, hydroxy lower alkyl, lower alkyl, phenyl, carboxy, lower alkoxycarbonyl, lower alkylcarbonyloxy lower alkyl, amido and carbamyl, with the proviso that only one R can be lower alkyl or phenyl; wherein X, Y and Z can be the same or different and are each selected from the group consisting of hydrogen, lower alkyl, carboxy, lower alkoxycarbonyl, with the proviso that at least one of X, Y and Z be selected from the group consisting of carboxy and lower alkoxycarbonyl, and, when X and Y are each lower alkoxycarbonyl, Z is carboxy or lower alkoxycarbonyl, with the further proviso that only one of X, Y and Z can be lower alkyl; a is 0 to less than 1 and a+b=1; and n is a whole integer which ranges from about 5 to about 10,000

thereby to improve the wet-strength properties of said freshly-prepared wet-mat so that it can be readily handled and transferred during other steps in said process, including the drying and binder application units of the production line for said process, into a finished glass fiber mat product.

4,178,205

HIGH STRENGTH NON-WOVEN FIBROUS MATERIAL

Ritchie A. Wessling; William A. Foster, both of Midland, and Dale M. Pickelman, Auburn, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1977, Ser. No. 825,319

Int. Cl.[2] D21H *3/38*

U.S. Cl. 162—168 R **11 Claims**

1. A method for preparing non-woven fibrous web comprising:

(a) mixing an aqueous slurry of a negatively charged, water-insoluble, natural or synthetic fiber or a blend of such fibers with a structured particle latex having particles consisting of a non-ionic organic polymer core encapsulated by a thin polymer layer having bound charges of pH independent cationic groups, said charges being present in an amount of from about 0.15 milliequivalent to about 0.6 milliequivalent per gram of polymer in the latex; the non-ionic polymer core having a glass transition temperature of from about −80° C. to about 100° C.; the amount of said latex being not greater than the amount required to cause charge reversal on the fiber;

(b) draining water from the aqueous suspension to form a wet web;

(c) wet pressing the web; and

(d) heating the wet web; whereby there is formed a non-woven fibrous web having polymer uniformly distributed and bonded to the fiber.

4,178,206

METHOD OF FORMING GLASS FIBER DISPERSIONS WITH CATIONIC QUATERNARY AMMONIUM SURFACTANTS HAVING AT LEAST TWO LONG CHAIN GROUPS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

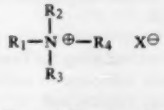
Filed Feb. 10, 1978, Ser. No. 876,651

Int. Cl.[2] D21H *5/18*

U.S. Cl. 162—156 **20 Claims**

1. In the manufacture of uniform glass mats at a high rate of production by the wet-laid process, the improved method which comprises

forming an aqueous dispersion of glass fibers by mixing bundles of said fibers of about ¼ to 3 inches in length in an aqueous medium at a fiber consistency of about 0.001 to 3.0% with about 5–500 ppm of a cationic quaternary ammonium surfactant compound having the formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, straight chain or branched, or two or more form a cyclic

group, saturated or unsaturated, substituted or unsubstituted, at least two of said radicals containing at least 10 carbon atoms each, being the same or different, the sum of the carbon atoms in R_1, R_2, R_3 and R_4 being at least 22 and less than about 48, and X is an anion thereby to substantially disperse said bundles into individual fibers within the aqueous medium, and,

passing said dispersion through a mat-forming screen to form the desired uniform glass fiber mat.

4,178,207

APPARATUS FOR PRODUCTION OF COMBUSTIBLE AMMUNITION CONTAINERS

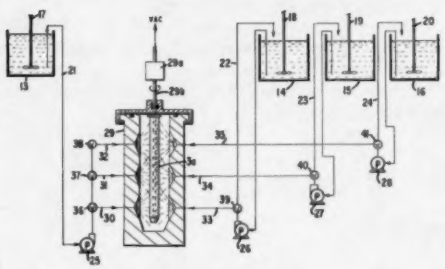
Wilhelm Oversohl, Koblenz-Karthause, Fed. Rep. of Germany, assignor to Wasag Chemie AG, Munchen-Unterfohring, Fed. Rep. of Germany

Division of Ser. No. 755,653, Dec. 30, 1976, Pat. No. 4,068,589. This application Sep. 15, 1977, Ser. No. 833,567

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1974, 2428632

Int. Cl.[2] D21J *7/00*

U.S. Cl. 162—384 **5 Claims**



1. Apparatus for the production of combustible munition containers which are non-uniform in composition axially but which are uniform in composition transaxially, which comprises a normally vertical, hollow, water-permeable but fiber-impermeable form having a circular cross section; controllable means for rotating said form axially; controllable means for maintaining the interior of said form under partial vaccum; controllable means connected to a suspension supply means for contacting one axial zone of said form with an aqueous suspension of a mixture of fibrous propellant material, cellulose papermaking fibers and binder material therefor; controllable means connected to additional suspension supply means for contacting at least an adjoining axial zone of said form with an additional suspension of said materials in a different ratio; and controllable means for removing liquid from the interior of said form.

4,178,208

SELF LOCKING DRIVE SYSTEM FOR ROTATING PLUG OF A NUCLEAR REACTOR

James E. Brubaker, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1978, Ser. No. 880,679

Int. Cl.[2] G21C *19/20*; F16H *1/16*; B66C *17/08*

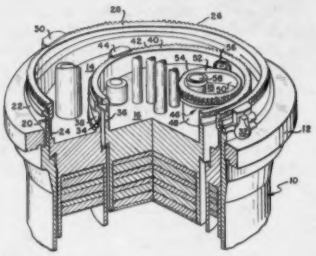
U.S. Cl. 176—30 **4 Claims**

1. A self locking drive system for rotating a refueling plug eccentrically mounted on the head of a large fast nuclear reactor, said refueling plug having a bull gear mounted on the edge thereof comprising:

a self locking double enveloping worm gear set consisting of a worm intermeshed with a matching worm gear,

a pair of matched idler gears both intermeshing with said bull gear,

a pinion gear intermeshing with both of said idler gears, said pinion gear and said worm gear being mounted for rotation on the same shaft



whereby said self locking double enveloping worm gear set prevents unwanted rotation of the refueling plugs as the result of seismic forces caused by an earthquake.

4,178,209

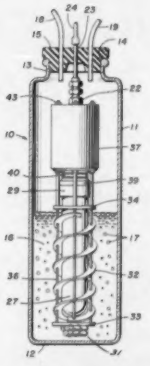
CONTINUOUS CELL CULTURE METHOD AND APPARATUS

William R. Tolbert, Manchester; Joseph Feder, University City, and Richard C. Kimes, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 850,987, Nov. 14, 1977. This application Mar. 6, 1978, Ser. No. 884,076

Int. Cl.[2] C12K *9/00*

U.S. Cl. 435—241 **5 Claims**



1. Apparatus for the continuous suspension culturing of cells comprising

(A) a hollow flask having an opening at the top,

(B) a stationary, hollow shaft means positioned within said flask, in fluid communication with said top opening of said flask and supported downwardly therefrom without any lower bearing,

(C) a stationary filter unit supported downwardly from said shaft means without any lower bearing and without any moving seals between the filter unit and any filter support means which could contact the cell suspension, said filter having

(1) a fluid collection cavity in direct fluid communication with the interior of said shaft means and the top of said flask, and

(2) a porous peripheral surface having a pore size smaller than the cells to be cultured or the carrier particles upon which said cells are attached but sufficiently large to permit permeation of fluid into said fluid collection cavity, and

(D) a rotatable agitator means concentrically disposed about

said filter unit for rotation by suspension from sleeve bearing means having low-friction engagement with said hollow shaft means.

5. In the method of continuous cell culture comprising growing animal cells in an agitated liquid suspension of nutrient culture medium containing amino acids, mineral salts, vitamins and carbohydrates and periodically removing filtered liquid from the cells, the improvement comprising carrying out the agitation and filtering without any moving bearing or seal surfaces contacting said cells which could cause cell disruption and with agitator means concentrically disposed about the filter for rotation to substantially prevent any clogging of said filter with cell debris.

4,178,210

ACCELLULAR SYNTHESIS OF CEPHALOSPORINS

Arnold L. Demain, Wellesley, Mass., and Masanobu Kohsaka, Osaka, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 775,156, Mar. 7, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 880,036

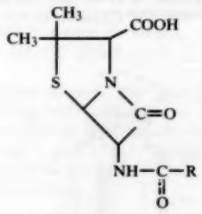
Int. Cl.² C12D *9/00*

U.S. Cl. 435—47 **10 Claims**

1. A process for producing a cephalosporin antibiotic, said process comprising the steps of:

providing a cell-free extract of *Cephalosporium acremonium;*

providing a source of starting material comprising a substance having the formula:



wherein R is a hydrocarbon containing 1–4 carbon atoms terminally substituted with a radical selected from the group consisting of carboxy, amino, and combinations thereof;

contacting the extract and the starting material in a reaction zone while promoting oxygen transfer;

providing ATP as an energy source to said reaction zone; and

allowing a component of the extract to react with said precursor for a sufficient amount of time to produce a cephalosporin antibiotic.

4,178,211

PROCESS FOR PRODUCING CITRIC ACID

Richard I. Leavitt, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 773,976, Mar. 3, 1977, abandoned. This application May 30, 1978, Ser. No. 910,359

Int. Cl.² C12D *1/04*

U.S. Cl. 195—30 **8 Claims**

1. A process for producing citric acid which comprises aerobically fermenting a mixed carbon source nutrient medium in a submerged culture of *Candida lipolytica,* ATCC-20510, said process being further characterized in that said mixed carbon source is a mixture of a carbohydrate and acetic acid or salt thereof with the fermentation liquor having an initial concentration of from about 1 to about 5 percent by weight of said acetic acid or salt thereof and, as a fermentation initiator, from 0.5 to about 2.5 percent by weight of said carbohydrate with no further addition of said carbohydrate to the fermentation mixture and a total of from about 5 to about 20 percent by weight of said acetic acid or salt thereof being added over the total fermentation period of from about 1 to about 15 days whereby said process produces a weight ratio of citric to isocitric acid of at least 4:1, respectively.

4,178,212

STABILIZED THYMIDINE PHOSPHORYLASE FORMULATION

Thomas A. Krenitsky, Chapel Hill, and Stanley R. M. Bushby, Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 652,770, Jan. 27, 1976, Pat. No. 4,097,337. This application Mar. 27, 1978, Ser. No. 890,781

Claims priority, application United Kingdom, Jan. 27, 1975, 3445/75

Int. Cl.² C07G *7/026*

U.S. Cl. 435—32 **3 Claims**

1. A stabilized thymidine phosphorylase formulation comprising thymidine phosphorylase of bacterial origin in phosphate buffer containing ammonium sulfate, said formulation containing at least 5 mg of protein per ml.

4,178,213

FERMENTATION PROCESS FOR THE PRODUCTION OF (+)-2-(5β-N-BUTYL-4β-HYDROXY-2-OXO-TETRAHYDROFURAN-3β-YL)-2α-METHYLACETIC ACID

David C. Aldridge; Roger Bowling, and John C. Swait, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

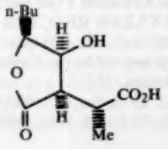
Filed Dec. 27, 1977, Ser. No. 864,473

Claims priority, application United Kingdom, Jan. 13, 1977, 1310/77; Mar. 14, 1977, 10622/77

Int. Cl.² C12D *13/00*

U.S. Cl. 435—126 **12 Claims**

1. A fermentation process for the production of (+)-2-(5β-n-butyl-4β-hydroxy-2-oxo-tetrahydrofuran-3β-yl)-2α-methylacetic acid having the formula:



I

which comprises cultivating a dihydrocanadensolide yielding strain of a species of the genus Penicillium or of the genus Aspergillus, in an aqueous nutrient medium containing a source of assimilable carbon and a source of assimilable nitrogen, isolating the compound of formula I by extracting the culture filtrate at a pH from 3.8–5.0 with a substantially water immiscible organic solvent, and evaporating the extract to dryness.

4,178,214
CULTURE MEDIUM FOR CULTIVATION OF FODDER YEASTS

Zinaida P. Shishkova, ulitsa Struktoru, 4a, kv. 21; Arvid Y. Kalninsh, ulitsa Sverdlova, 8, kv. 3; Juris P. Gailitis, ulitsa Bikernieku, 37, kv. 26; Uldis Y. Shmit, ulitsa Lenina, 118, kv. 21; Nikolai A. Vedernikov, ulitsa Aptiekas, 8, kv. 66; Valter P. Krastinsh, ulitsa Sabiles, 11, kv. 12, all of Riga; Damir A. Kalinkin, ulitsa Volodarskogo, 130, kv. 109, Bobruisk; Viktor R. Vaax, ulitsa Minskaya, 113, kv. 70, Bobruisk; Maria A. Zinina, ulitsa Minskaya, 101, kv. 61, Bobruisk; Vasily D. Belyaev, Sivtsev Vrazhek pereulok, 33, kv. 5, Moscow; Nikolai S. Maximenko, ulitsa Verkhnepervomaiskaya, 59/35, korpus 2, kv. 81, Moscow, and Yakov V. Epshtein, 11 Parkovaya ulitsa, 19/21, kv. 126, Moscow, all of U.S.S.R.

Filed Sep. 8, 1977, Ser. No. 831,602

Int. Cl.[2] A23K *1/00;* **A23J** *1/18;* **C12K** *1/00;* **C12C** *11/08*

U.S. Cl. 435—252 **5 Claims**

1. A liquid culture medium for cultivation of fodder yeasts which provide a source of proteins, vitamins and minerals in the diet of animals and birds, said liquid culture medium containing the following components in % by weight:

hydrolysate of ligneous wastes other than peat with pH=4.0–4.4: 48–97

peat hydrolysate obtained by hydrolysis of peat with sulphuric acid and having a pH=4.0–4.4: 0.1–50

nitrogen from a source other than said hydrolysates: 0.02–0.08

phosphorus measured as P_2O_5 from a source other than said hydrolysates: 0.03–0.12

potassium from a source other than said hydrolysates: 0.016–0.064

water: the balance.

4,178,215
METHOD OF MANUFACTURING BLAST FURNACE COKE

Yoshio Kiritani, Osaka; Michio Tsuyuguchi, Wakayama; Tetsuo Ibaragi, Wakayama; Katsuhiro Yano, Wakayama; Yoshihiko Sunami, and Kunihiko Nishioka, both of Amagasaki, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka and Sumikin Coke Company Limited, Wakayama, both of, Japan

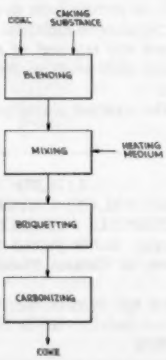
Filed Sep. 29, 1976, Ser. No. 728,009

Claims priority, application Japan, Jun. 30, 1976, 51-78088

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.[2] C10B *53/08, 57/00, 45/00*

U.S. Cl. 201—6 **15 Claims**



1. A method of manufacturing blast furnace coke comprising the steps of blending coals used for the production of coke with a caking substance to yield a mixture, powerfully mixing the mixture obtained for a time of one to five minutes with a mixer capable of applying mixing energy of more than 0.02 KW/kg while passing a heating medium through the mixture, briquetting the mixture obtained in said mixing step and producing coke by carbonizing the briquette obtained.

4,178,216
PROCESS FOR BIPOLAR ELECTRODE SUPPORT STRUCTURES

George F. Nordblom, Yardley, Pa.; Pierre P. Turillon, Ramsey, N.J.; Ernest L. Huston, Suffern, and Stephan L. Keresztes, Warwick both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 878,268, Feb. 16, 1978, Pat. No. 4,124,746.

This application Aug. 3, 1978, Ser. No. 930,554

Int. Cl.[2] H01M *10/44*

U.S. Cl. 204—2.1 **27 Claims**

1. A process for producing a sheet like article of manufacture adapted for use as a bipolar electrode support structure for a lead-acid battery, the process comprising:

forming a continuous, porous matrix in the configuration of said article, said matrix being constituted of a metal selected from titanium, tantalum, niobium and zirconium, or of an alloy of said metal which alloy exhibits valve metal-like electrical characteristics;

mechanically deforming a rim-portion of said matrix thereby decreasing the pore dimensions at least adjacent a preselected portion of a surface of said matrix, thereby inhibiting lead infiltration into said preselected portion of matrix surface during the next step of the process;

infiltrating said matrix with lead or lead alloy such that pores which communicate with the remainder of said surface are filled to a depth exceeding a first predetermined depth from said surface; and

electrochemically oxidizing said lead or lead alloy so as to ensure that said pores which communicate with said remainder of said surface are filled with lead dioxide to a depth which exceeds a second predetermined depth from said surface, but is less than said first predetermined depth.

4,178,217
ZINC ELECTROPLATING BATH

Klaus Glaser, Mutterstadt; Werner Streit, Bobenheim; Rolf Fikentscher, Ludwigshafen, and Guenther Gotsmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,912

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740592

Int. Cl.[2] C25D *3/22, 3/24*

U.S. Cl. 204—55 Y **3 Claims**

1. In an aqueous zinc electroplating bath which is used to produce very bright zinc coatings and which is acid or alkaline or contains alkali metal cyanide, and comprises a polyalkylenepolyamine as the brightener, the improvement wherein the brightener used is a compound prepared by alkylating a polyalkylenepolyamine of the formula

$$H_2N-(CH_2)_n-NH]_xH,$$

in which n denotes 2 to 4 and x 5 to 120, at the nitrogen by alkyl radicals of 1 to 4 carbon atoms and additionally alkylating the polyalkylene polyamine by alkyl radicals containing sulfo groups, the amount of the alkyl radicals containing sulfo groups to be introduced into the polyalkylene polyamine molecule being from 0.01 to 1.99 moles per equivalent of basic

nitrogen, and the ratio of alkyl groups to alkyl radicals containing sulfo groups being from 1:30 to 30:1.

4,178,218

CATION EXCHANGE MEMBRANE AND USE THEREOF IN THE ELECTROLYSIS OF SODIUM CHLORIDE

Maomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 836,417, Sep. 26, 1977, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar. 7, 1975, abandoned. This application Nov. 9, 1978, Ser. No. 959,312

Claims priority, application Japan, Mar. 7, 1974, 49-25718

Int. Cl.[2] C25B *1/16, 1/28, 9/00, 13/08*

U.S. Cl. 204—98 **54 Claims**

1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a cation exchange membrane consisting essentially of a fluorocarbon polymer containing pendant carboxylic acid and sulfonic acid groups, the total ion exchange capacity of sulfonic and carboxylic acid groups being from 0.5 to 4.0 milliequivalents per gram of dry resin, the ratio of carboxylic acid groups to sulfonic acid groups being in the range of from 1:100 to 100:1.

4,178,219

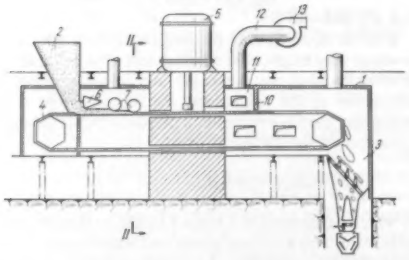
METHOD FOR PRODUCING MINERAL BINDER

Iosif G. Abramson, Varshavskaya ulitsa, 22, kv. 16; Boris V. Volkonsky, ploschad Chernyshevskogo, 7, kv. 7; Vasily A. Glukhikh, Belgradskaya ulitsa, 10, korpus 1, kv. 5; Solomon I. Danjushevsky, ploschad Chernyshevskogo, 7, kv. 79; Georgy B. Egorov, Grazhdansky prospekt, 90, korpus 2, kv. 103; Raisa A. Zozulya, 9 linia, 76, kv. 7; Alexei I. Natnenkov, Metallostroi, ulitsa Polevaya, 22, kv. 31; Jury V. Nikiforov, Zanevsky prospekt, 30, kv. 23; Rafail M. Nudelman, Nevsky prospekt, 61, kv. 1; Alexandr M. Khomyakov, Ivanovskaya ulitsa, 18, kv. 15; Boris M. Bresler, Lermontovsky prospekt, 8/10a, kv. 30; Igor A. Prudnikov, ulitsa Dimitrova, 4, korpus 1, kv. 221; Janetta M. Tseitlin, prospekt Veteranov, 40, kv. 10; Zalman L. Axelrod, Svetlanovsky prospekt, 117, kv. 168; Anatoly M. Zharnitsky, ploschad Chernyshevskogo, 7, kv. 46; Jury A. Makeev, Kuznetsovskaya ulitsa, 10, kv. 248; Ivan F. Malyshev, Kustarny pereulok, 8, kv. 4; Mikhail P. Svinin, Metallostroi Polevaya ulitsa, 25, kv. 25, all of Leningrad, U.S.S.R., Evgeny G. Komar, deceased, late of Leningrad, U.S.S.R., by Khaya S. Boguslavskaya, administrator, Kuznetsovskaya ulitsa, 36, kv. 26, Leningrad, U.S.S.R., by Olga E. Komar, administrator, Grazhdanskaya ulitsa, 16, kv. 11, Pushkin, U.S.S.R., and by Alexandr E. Komar, administrator, Kuznetsovskaya ulitsa, 36, kv. 26, Leningrad, U.S.S.R.

Continuation of Ser. No. 561,075, Mar. 24, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,894

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 H **2 Claims**



1. A method of producing a mineral binder comprising the steps of: forming a layer of a Portland cement raw stock mixture having a uniform thickness heating the stock mixture to a temperature not over 600° C., and exposing the layer of stock mixture to ionizing radiation with the power of absorbed dose of at least 1 Mrads/s by moving the layer past an ionizing radiation source, the speed of movement being sufficient to thoroughly irradiate the stock mixture to produce a Portland cement clinker.

4,178,220

UNIFORMLY IRRADIATED POLYMER FILM

Stephen L. Fowler, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 4, 1977, Ser. No. 784,184

Int. Cl.[2] C08F *8/00*

U.S. Cl. 204—159.14 **8 Claims**

1. A film of electron irradiated polymer with a substantially uniform electron irradiation dosage across the entire width thereof, said film having an electron dosage variation of less than plus or minus 15 percent of the mean dosage and having been produced by passing a film through an electron irradiation zone having disposed therein adjacent the film edges deflection blocks for deflecting electrons toward a deflection bottom for further deflecting said electrons toward the bottom edges of the film being irradiated.

4,178,221

PROCESS FOR THE PREPARATION OF WATER-SOLUBLE ACRYLIC POLYMERS BY PHOTOPOLYMERIZATION

Jean Boutin, Saint-Priest, and Jean Neel, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,659

Claims priority, application France, Apr. 14, 1976, 76 11634

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **29 Claims**

1. A method for the preparation of water-soluble acrylic polymers comprising:

(a) continuously depositing on a support a thin layer of an aqueous solution comprising acrylic monomer and a photopolymerization initiator, said solution being substantially free of dissolved oxygen;

(b) subjecting the thin liquid layer on the support to a first radiation stage comprising exposure to radiation of wavelengths between about 300 and 450 mμ and of average power between about 20 and 300 watt/m^2 for approximately 1 to 20 minutes in a gaseous atmosphere substantially free of oxygen while cooling said support to remove the heat of reaction;

(c) maintaining the cooled support in said oxygen free atmosphere while subjecting same to a second radiation stage comprising exposure to radiation of wavelengths between about 300 and 450 mμ and of average power between about 300 and 2000 watt/m^2 for approximately 1 to 20 minutes; and

(d) detaching the resultant partially solidified layer from the support.

4,178,222

SOLID ELECTROLYTE OXYGEN SENSOR WITH ELECTRICALLY ISOLATED HEATER

Michael P. Murphy, and Raymond D. Willis, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

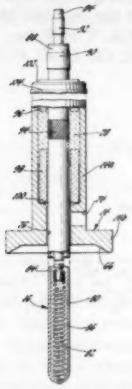
Filed Apr. 3, 1978, Ser. No. 892,642

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **6 Claims**

1. In a galvanic exhaust gas sensor having a solid electrolyte member, a subassembly comprising a heater and an outwardly flanged terminal tube for said electrolyte member, an inwardly flanged tubular metal shell surrounding said electrolyte member and heater-terminal tube subassembly, and means coacting with said flanges for holding said member, subassembly and

shell in a fixed predetermined relationship, the improvement wherein said heater-terminal tube subassembly includes at least one ceramic sleeve coaxially disposed within the terminal tube and extending along a substantial length thereof, an elongated heater disposed within the ceramic sleeve, and a vitreous material bonding said heater, sleeve and terminal tube together as a subassembly in predetermined disposition with respect to said electrolyte member, whereby said vitreous material supports said heater on said terminal tube, said ceramic sleeve aligns said heater within said terminal tube, and the heater and terminal tube are thermally separated and electrically isolated.



4,178,223

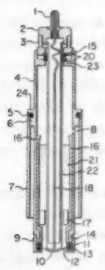
ELECTRICAL OXYGEN PROBE

Minoru Ohashi; Youichi Ishikawa; Makoto Shouda, and Tamon Watabe, all of Tokyo, Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 815,278, Jul. 13, 1977, abandoned. This application May 4, 1978, Ser. No. 902,840

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 P **7 Claims**



1. An electrical oxygen probe in a galvanic membrane probe which comprises a cathode, an anode, an oxygen permeable membrane, an electrolyte and an electrolytic cell wherein:

(i) said electrolytic cell is a metal tube, at the top of which an internal screw thread and an internal flange below the said thread are provided, in the center of which an external screw thread is provided, an external flange above the said thread and a vent hole below the said external thread for the adjustment of inner and outer pressures are provided, at the bottom of which an external screw thread is provided;

(ii) a metal which constitutes the anode is lined on the internal wall of the said electrolytic cell from the bottom to a suitable height;

(iii) the said cathode is comprised of a metal disposed at one end of a glass tube and a lead wire connected at one end to the cathode metal and extending through the glass tube at the other end;

(iv) the said oxygen permeable membrane is sticked on the bottom of the electrolytic cell by clamping with a O-ring, a washer and a cap having several grooves to eliminate foam, wherein the said membrane contacts with the surface of the said cathode;

(v) the said glass tube is kept in the center of the said electrolytic cell by clamping the upper parts of the said glass tube with O-rings which are compressed between a plug and said internal flange; and

(vi) the said electrolytic cell contains an electrolyte and in the center of which a protection cover is screwed to the said cell and is compressed to a O-ring and the said external flange.

4,178,224

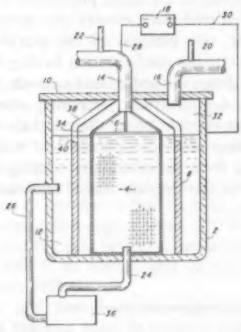
APPARATUS FOR GENERATION AND CONTROL OF DOPANT AND REACTIVE GASES

Vernon R. Porter, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1978, Ser. No. 870,912

Int. Cl.[2] C25B *9/00, 15/08*

U.S. Cl. 204—237 **10 Claims**



1. An electrochemical generator for the electrolytic generation of arsine comprising:

a cylindrical member open at one end thereof; said cylindrical member also comprising copper or silver as the cathode of said generator;

an anode comprising a platinum group metal suspended in the center of said cylindrical member;

a cylindrical barrier concentric with said cylindrical member and surrounding said anode, said cylindrical membrane separating said cylindrical member into an annular region and a central region, said cylindrical barrier having impermeability to the gases from said anode and said cathode;

a cover sealing said open end of said cylindrical member, said cover isolating said annular region from said center region;

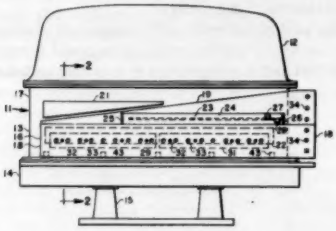
a first port in said cover for passing gas from said annular region; and

a second port in said cover for passing gas from said center region.

4,178,225
CATHODE BUSBAR STRUCTURE

Walter W. Ruthel, Grand Island, and Leo G. Evans, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 590,799, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,428, Jan. 3, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 852,401
Int. Cl.[2] C25B 9/04
U.S. Cl. 204—279 4 Claims



1. A cathode busbar structure for an electrolytic cell having a high current capacity comprising
(a) a conductive cathode walled enclosure;
(b) at least one lead-in busbar, a side portion of said lead-in busbar extending outward of said cathode walled enclosure and adapted for electrical jumpering connection, said lead-in busbar being parallel to but not in physical contact with said cathode walled enclosure and adapted for electrical inter-cell connection along the lengthwise portion thereof;
(c) a plurality of busbar elements, physically contacting said cathode walled enclosure, electrically connected to said lead-in busbar, one element of the plurality of busbar elements of a tapered configuration having the larger end portion extending outward of said cathode walled enclosure adapted for electrical jumpering connection, said tapered busbar element being thicker than the remaining busbar elements, and said plurality of busbar elements combining to form an essentially rectangular electrical contact area on the cathode walled enclosure.

4,178,226
COMPATIBLE MIXTURES OF COAL LIQUIDS AND PETROLEUM BASED FUELS

Albert V. Cabal, Woodbury; Joseph G. Bendoraitis, Pitman; Robert B. Callen, West Deptford; Robert T. Pavlica, Princeton, all of N.J., and Sterling E. Voltz, Media, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

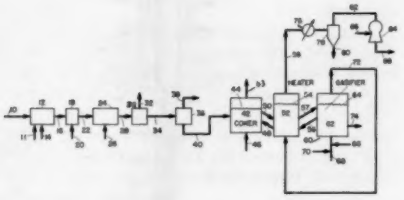
Filed Apr. 15, 1977, Ser. No. 787,803
Int. Cl.[2] C10L 1/04
U.S. Cl. 208—15 5 Claims

1. Compatible mixtures of coal liquids and petroleum based fuels boiling above about 250° F. and having at least about 10 weight percent of each of the components wherein said coal liquid is prepared by processing with solvent in the presence of hydrogen as a hydrogen donor solvent or as hydrogen gas and is free of the 950° F.+ fraction as a result of hydroprocessing, deasphalting or distillation.

4,178,227
COMBINATION HYDROCONVERSION, FLUID COKING AND GASIFICATION

William J. Metrailer; Roby Bearden, Jr., and Clyde L. Aldridge, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 889,744, Mar. 24, 1978. This application Jun. 7, 1978, Ser. No. 913,394
Int. Cl.[2] C10G 37/00
U.S. Cl. 208—50 21 Claims



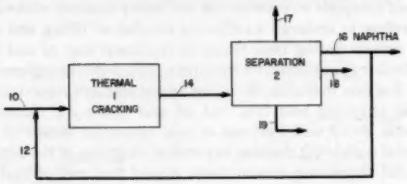
1. A process for upgrading a carbonaceous chargestock, which comprises:
(a) adding to said carbonaceous chargestock an oil soluble metal compound of a metal selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof;
(b) converting said oil soluble metal compound to a solid catalyst within said chargestock in the presence of a hydrogen-containing gas by heating said chargestock to an elevated temperature;
(c) reacting the chargestock containing said catalyst with hydrogen under hydroconversion conditions, in a hydroconversion zone to produce an upgraded hydrocarbonaceous oil product;
(d) separating a heavy oil fraction from said hydrocarbonaceous oil product;
(e) contacting at least a portion of said heavy oil fraction with a bed of fluidized solids maintained in a fluid coking zone under fluid coking conditions to form coke, said coke depositing on said fluidized solids;
(f) introducing a portion of said solids with a coke deposit thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;
(g) recycling a first portion of heated solids from said heating zone to said coking zone;
(h) introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature greater than the temperature of said heating zone;
(i) reacting said second portion of heated solids in said gasification zone with steam and a molecular oxygen-containing gas to produce a hot gaseous stream containing hydrogen;
(j) introducing said hot gaseous stream containing hydrogen and entrained solids into said heating zone;
(k) recovering from said heating zone the resulting cooled gaseous stream containing hydrogen and entrained solid carbonaceous fines;
(l) separating at least a portion of said solid carbonaceous fines from said cooled gaseous stream, said separated fines having an average particle size of less than 10 microns in diameter, and
(m) recycling at least a portion of said separated fines to such chargestock of step (a).

4,178,228

THERMAL CRACKING OF GAS OIL TO MIDDLE DISTILLATE

Bong H. Chang, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 7, 1978, Ser. No. 913,307
Int. Cl.[2] C10G *9/46, 37/02*
U.S. Cl. 208—72 **17 Claims**



15. A two-stage process for the thermal cracking of a hydrocarbonaceous feedstock which comprises:

(a) treating a heavy hydrocarbonaceous oil comprising residual components in a first thermal cracking zone at thermal cracking conditions including a temperature ranging from about 700° to 1100° F. and a pressure ranging from about 50 to about 1500 psig to produce a first thermally cracked product;

(b) separating from said first thermally cracked product a gas oil fraction;

(c) passing at least a portion of said separated gas oil fraction to a second thermal cracking zone;

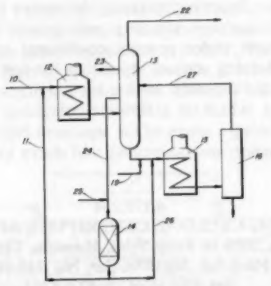
(d) treating said portion of said separated gas oil in said second thermal cracking zone at thermal cracking conditions including a temperature ranging from about 700° to 1100° F. and a pressure ranging from about 50 to about 1500 psig in the presence of an added olefin-containing naphtha, said naphtha containing at least about 10 volume % olefins and less than about 30 volume % aromatics.

4,178,229

PROCESS FOR PRODUCING PREMIUM COKE FROM VACUUM RESIDUUM

James R. McConaghy; Paul C. Poynor, and John R. Friday, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed May 22, 1978, Ser. No. 908,333
Int. Cl.[2] C10G *13/24, 37/02*
U.S. Cl. 208—50 **5 Claims**



1. A process for producing premium coke comprising:

(a) subjecting a heavy liquid hydrocarbonaceous material having an initial boiling point above 340° C. to a hydrogen donor diluent cracking operation;

(b) separating a pitch fraction including substantially all of the 510° C.+ material from the effluent of the hydrogen donor diluent cracking operation, said pitch fraction including part of the gas oil fraction from said effluent;

(c) passing at least part of the remainder of the gas oil fraction from said effluent to a hydrotreating step to produce a hydrotreated gas oil fraction;

(d) utilizing a first part of the hydrotreated gas oil fraction as donor diluent in said hydrogen donor diluent cracking operation;

(e) combining said pitch fraction and a second part of the hydrotreated gas oil fraction to provide a coker feedstock in which the total amount of material boiling above 510° C. in said coker feedstock is not more than 30 volume percent; and

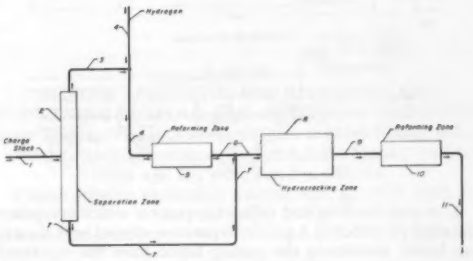
(f) introducing said coker feedstock to a delayed premium coking operation whereby premium delayed coke is produced.

4,178,230

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF AROMATIC HYDROCARBONS AND ISOBUTANE

James A. Johnson, Clarendon Hills, and Raouf G. Touma, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 22, 1978, Ser. No. 908,300
Int. Cl.[2] C10G *37/10;* C07C *9/12*
U.S. Cl. 208—66 **8 Claims**



1. A process for the simultaneous production of an aromatic concentrate and an isobutane concentrate from a hydrocarbon charge stock boiling below about 500° F., and containing from about 14 to about 65 volume % naphthene hydrocarbon components which comprises the steps of:

(a) separating said charge stock into two fractions in a separation zone to provide a first fraction processing an end boiling point in the range of about 300° F. to about 400° F., and a second fraction having an initial boiling point in the range of 300° F. to 400° F. and an end boiling point not greater than 410° F.;

(b) reacting said first fraction, with hydrogen, in a first reforming reaction zone, in contact with a first catalytic composite comprising platinum and alumina at a temperature in the range of about 800° F. to about 1100° F. and a pressure of from about 100 to about 400 psig, said temperature and pressure selected to convert from about 25 volume % to about 90 volume % of said about 14 volume % to about 65 volume % naphthene hydrocarbon components to aromatic hydrocarbons within the first reforming zone effluent stream;

(c) admixing said first reforming zone effluent stream, without intermediate separation of the same to remove C_4^- light ends therefrom, with said second fraction processing an end boiling point of not greater than 410° F., in a hydrocracking reaction zone to hydrocrack both of said fractions, in contact with a second catalytic composite comprising a Group VIII noble metal component and a zeolitic aluminosilicate carrier material at a temperature in the range of about 350° F. to about 800° F. and a pressure from about 100 to about 400 psig, to produce a hydrocracking reaction zone effluent;

(d) reacting said hydrocracking reaction zone effluent, without intermediate separation of the same to remove C_4^- light ends therefrom, in a second reforming reaction zone

in contact with a third catalytic composite comprising platinum and alumina, at a temperature in the range of about 800° F. to about 1100° F. and a pressure of from about 100 to about 400 psig to produce a second reforming reaction zone effluent stream; and

(e) recovering said isobutane concentrate from said second reforming reaction zone effluent stream.

4,178,231

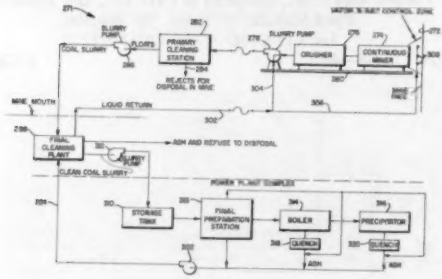
METHOD AND APPARATUS FOR COAL SEPARATION USING FLUORINATED HYDROCARBONS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Lafayette, N.Y.

Division of Ser. No. 561,168, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,805

Int. Cl.[2] B03B *5/44, 9/00*

U.S. Cl. 209—3 **31 Claims**



1. A coal handling and utilization process which comprises the steps of: effecting a gravity separation of coal with a parting liquid; recovering the parting liquid from the separated coal and from the foreign material from which the coal is separated; burning said coal; mixing parting liquid as aforesaid with ash generated in the combustion of the coal to form a slurry; effecting a flow of the slurry to the means in which the recovery of the parting liquid from the foreign material was effected; and effecting a separation of the parting liquid associated therewith from said ash in said last-mentioned means.

4,178,232

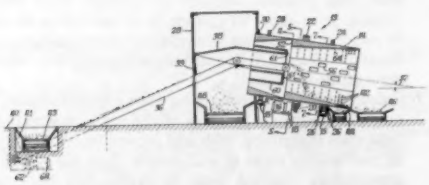
APPARATUS FOR SEPARATING SOLID MATERIALS

Anthony R. Nollet, Wilmington, Del., assignor to Cargill, Incorporated, Minneapolis, Minn.

Division of Ser. No. 669,831, Mar. 24, 1976, Pat. No. 4,070,202. This application Aug. 22, 1977, Ser. No. 826,645

Int. Cl.[2] B03B *9/06*

U.S. Cl. 209—3 **15 Claims**



1. An air drum processor for separating previously unprocessed refuse into a low bulk density substantially combustible light fraction of at least 50 percent by weight of the refuse and a high bulk density substantially incombustible heavy fraction comprising: a rotatable drum having its axis of rotation inclined at a predetermined angle to the horizontal and being open at at least one end; means for rotating said drum about its axis; conveyor means having a free end extending into said drum for charging the refuse directly into a rotating portion of said drum at a position intermediate the ends thereof while said drum is rotating; means for lifting and dropping the refuse within said drum during rotation thereof to expose the refuse materials to air separation; means for causing a stream of air to flow axially through said drum at a predetermined velocity to separate the charged refuse materials by virtue of their area to mass ratio and aerodynamic shape as the light fraction at the upper end of said drum, said drum having a length from the materials charging position in said drum to the lower end thereof adequate to provide for the heavy fraction materials in said refuse to undergo a sufficient number of lifting and dropping actions during their travel to the lower end of said drum for discharge as the heavy fraction to effect disentanglement of light fraction materials from the heavy fraction materials; and means covering said free end of said conveyor means and turnable about said free end of said conveyor means to drop material collecting thereon to prevent clogging of the drum by material stagnating in said drum at said free end of said conveyor.

4,178,233

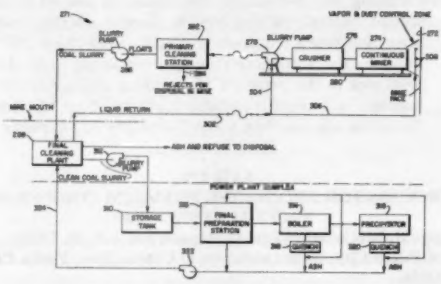
FLUORINATED HYDROCARBONS IN COAL MINING AND BENEFICIATION

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Lafayette, N.Y.

Division of Ser. No. 561,168, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,804

Int. Cl.[2] B03B *5/44, 9/00*

U.S. Cl. 209—3 **34 Claims**



1. A coal handling and processing method which includes the steps of mining the coal; forming a slurry of said coal with a carrier liquid which comprises a non-toxic, non-corrosive, non-flammable flourine-containing derivative of methane or ethane which has low viscosity and surface tension and is chemically inert under process conditions; conveying said slurry to a cleaning station; separating foreign material from the coal at said cleaning station by gravity separation in a parting liquid which is a flourine-containing derivative as aforesaid; forming a slurry of the separated coal in the parting liquid as a carrier; and conveying said slurry to a terminus.

4,178,234

ROTATING CYCLONE CENTRIFUGE APPARATUS

Roy A. Bobo, 2000 N. Loop West, Houston, Tex. 77018

Filed Jul. 20, 1978, Ser. No. 926,441

Int. Cl.[2] B04C *5/107, 5/13*

U.S. Cl. 209—211 **10 Claims**

1. A rotating cyclone apparatus for separating heavy solid phases from light solid phases in a liquid, comprising:

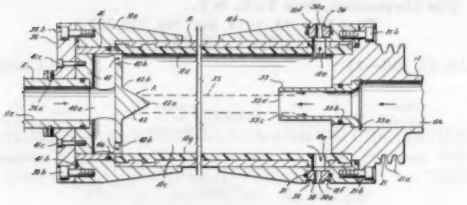
an elongate centrifuge housing with a separation chamber and having an axial inlet for liquid feed into the housing and a heavy phase outlet discharge through the side wall of the housing and a light phase outlet substantially in the central portion of the housing, with both of said outlets

being at the opposite end portion of said separation chamber from said inlet;

means for introducing air into said housing at the light phase outlet in a direction opposite to the direction of the discharge of the light phase to form an air core in the light phase discharge at substantially the central portion of the housing;

means for rotating said housing for creating a forced vortex;

an accelerator mounted at the inlet end of said housing for rotation with said housing and for imparting a helical flow to the inlet liquid combining the forced vortex and a free



vortex at a velocity in excess of the velocity of rotation of said housing;

a rotatable re-entrant discharge tube extending into said separation chamber at substantially the central portion thereof and forming a part of the light phase outlet from said separation chamber at the opposite end of said chamber from said inlet; and

said re-entrant discharge tube extending into said separation chamber with its inlet opening inwardly of said heavy phase outlet discharge to inhibit a by-pass of the separated heavy phase outwardly with the light phase discharge.

4,178,235

FLOTATION RECOVERY OF PYROCHLORE

James A. Wilson, 13 Hilltop Rd., Port Washington, N.Y. 11050

Filed Jun. 30, 1978, Ser. No. 921,116

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **3 Claims**

1. A process of froth flotation which includes agitating and aerating a pulp consisting of substantially liberated pyrochlore and associated minerals while suspended in a water solution of 5-hydroxyquinoline and collecting a rougher pyrochlore concentrate in a froth overflow and a rougher tailing in a pulp underflow.

4,178,236

MOBILE APPARATUS FOR RECEIVING AND CONVEYING FERROUS RAIL FASTENING ELEMENTS

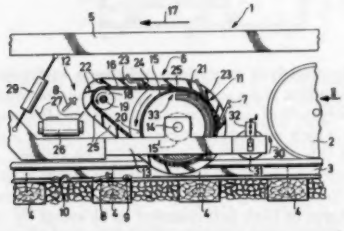
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 20, 1978, Ser. No. 898,143

Claims priority, application Austria, Aug. 29, 1977, 6237/77

Int. Cl.[2] B03C *1/12*

U.S. Cl. 209—215 **9 Claims**



1. A mobile apparatus for receiving and conveying ferrous rail fastening elements disposed on the surface of a ballast bed, which comprises

(a) a carriage mounted for mobility in an operating direction on two rails of a track resting on the ballast bed,

(b) a carrier frame mounted vertically adjustably on the carriage,

(c) magnetic drums mounted on the carrier frame, the magnetic drums being associated with at least one of the rails and extending laterally thereof at both sides of the rail,

(1) each of the magnetic drums including a drive for rotation of the drum about an axis extending transversely to the track,

(d) an endless conveyor band trained about each of the magnetic drums, the conveyor band having

(1) entrainment elements for the rail fastening elements, and

(e) a conveyor band arrangement mounted on the carriage and associated with the magnetic drums rearwardly thereof in the operating direction.

4,178,237

MOBILE APPARATUS FOR RECEIVING AND CONVEYING FERROUS RAIL FASTENING ELEMENTS

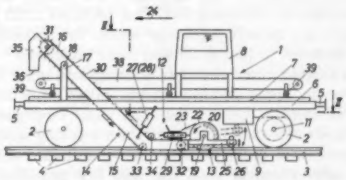
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 20, 1978, Ser. No. 898,144

Claims priority, application Austria, Apr. 22, 1977, 2861/77

Int. Cl.[2] B03C *1/12*

U.S. Cl. 209—215 **8 Claims**



1. A mobile apparatus for receiving and conveying ferrous rail fastening elements disposed on the surface of a ballast bed, which comprises

(a) a carriage mounted for mobility in an operating direction on two rails of a track resting on the ballast bed, the carriage including

(1) a frame,

(b) a vertically adjustable carrier frame having two ends,

(1) rollers supporting one of the carrier frame ends for movement along the track rails and

(2) support means supporting the other carrier frame end on the carriage frame,

(c) magnetic drum means mounted on the one carrier frame end, the magnetic drum means being associated with at least one of the rails and extending laterally thereof at both sides of the rail,

(1) the magnetic drum means including a drive for rotation of the drum means about an axis extending transversely to the track and,

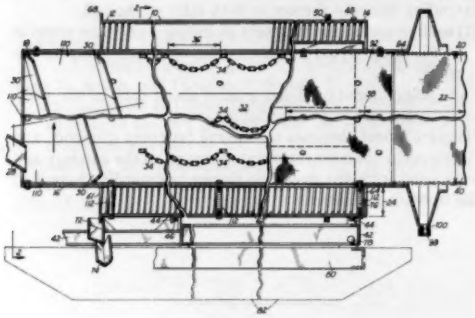
(d) a conveyor band arrangement mounted on the carrier frame, the conveyor band arrangement having a receiving end associated with the magnetic drum means and rearward thereof in the operating direction.

4,178,238

APPARATUS FOR PROCESSING LOW-GRADE AGGREGATE ORE

Loyd F. Harris, 118 N. Cole St., Molalla, Oreg. 97038

Filed Jan. 25, 1977, Ser. No. 762,255
Int. Cl.[2] B07B *1/18, 1/24*
U.S. Cl. 209—270 **4 Claims**



1. An apparatus for separating a metal-bearing aggregate ore being supplied thereto into first particles having a predetermined range of cross sections and second particles having cross sections greater than those of said first particles and for thereafter classifying said first particles into concentrates having a predetermined range of densities and tailings having densities less than those of said concentrates so as to maintain said concentrates within said predetermined density range substantially independently of changes in the particular characteristics of aggregate ore being processed therein, said apparatus comprising:

(a) an elongate inner chamber having upper and lower ends, an inlet proximate said upper end thereof for permitting the introduction of said aggregate ore thereto and selection means for selecting said first particles from said aggregate ore including passage means for permitting said first particles to pass from said inner chamber;

(b) an elongate outer chamber housing said inner chamber and having upper and lower ends and an inner configuration sufficiently greater than the outer configuration of said inner chamber so as to define a working space therebetween, said outer chamber being disposed relative to said inner chamber such that said first particles passing from said inner chamber enter into said working space;

(c) movement means mounted on the inner surface of said outer chamber for urging said first particles passing into said working space in a first direction toward said upper end of said outer chamber;

(d) compaction means for compacting said first particles upon said movement means into density layers with said concentrates moving to the lowermost layers;

(e) shaving means for directing a liquid flow through said outer chamber directly over the surfaces of said movement means in a second direction opposite to said first direction toward said lower end of said outer chamber, said shaving means applying sufficient hydraulic separative force to said first particles upon said movement means so as to agitate same sufficiently to remove said tailings therefrom and to move said tailings in said second direction; and

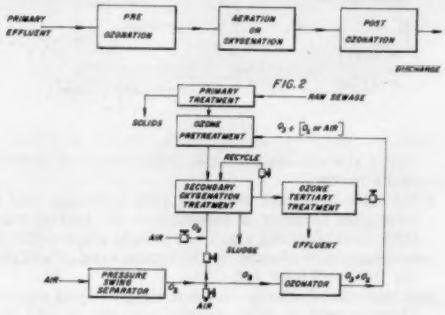
(f) said shaving means including a helical riffle, said riffle being comprised of a plurality of elongate ribs radially spaced about the inner surface of said outer chamber and helically spaced from each other by a predetermined distance, said helical spacing decreasing from a lower end of said outer chamber toward an upper end thereof, said elongate ribs protruding from the inner surface of said outer chamber and extending helically from said lower end to said upper end thereof, and wherein the protrusion of said ribs decreases from a first height proximate said lower end to a second height proximate said upper end so as to urge said first particles thereon in said first direction when said inner and outer chambers are rotated, create turbulence in said liquid flow and present a plurality of partial dams therefor.

4,178,239

BIOLOGICAL INTERMEDIATE SEWAGE TREATMENT WITH OZONE PRETREATMENT

Frank E. Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,223
Int. Cl.[2] C02B *1/38;* **C02C** *1/06*
U.S. Cl. 210—15 **2 Claims**



1. In a process for secondary treatment of aqueous sewage containing biodegradable materials and non-biodegradable materials wherein the sewage is contacted with an O_2-containing gas in the presence of aerobic microorganisms, the improvement which comprises:

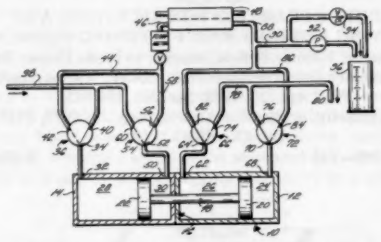
Contacting the sewage with an ozone-containing gas to pretreat the sewage by converting a substantial amount of the non-biodegradable material to biodegradable material.

4,178,240

FLUID HANDLING SYSTEM

Harry E. Pinkerton, Bridle Path La., Mill Neck, N.Y. 11765

Filed May 17, 1976, Ser. No. 686,856
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—22 A **16 Claims**



16. A hemodialysis procedure utilizing a hydraulic system comprising a first and a second receptacle, and partition means in each receptacle dividing the receptacles into first and second chambers which procedure comprises connecting a patient to the blood side of a dialysis cell having blood and dialysate solution sides, reciprocating said partition means in said receptacles to cause, during reciprocation of said partition means, equal volumes of each first chamber to be swept by said partition means and equal volumes of each second chamber to be swept by said partition means, admitting a dialysate solution alternately to each chamber of said first receptacle as it ex-

pands, transferring said solution through the dialysate side of the dialysis cell from each said chamber of said first receptacle as it contracts, alternately to an expanding chamber of equal volume in said second receptacle whereby blood wastes migrate across the membrane from the blood side to the dialysate side of said cell, providing an outlet from said circuit whereby the egress of liquid from the circuit in direct volumetric relationship to the quantity of blood wastes crossing said membrane will occur through said outlet, and measuring that egress.

4,178,241

METHOD OF REMOVING UREA AND/OR CREATININE

Thomas E. Sullivan, 9401 Persimmon Tree Rd., Potomac, Md. 20845, and Oscar L. Wright, 11 Kathy La., Monroe, La. 71203

Filed Sep. 20, 1978, Ser. No. 944,130

Int. Cl.[2] B01D *15/04*

U.S. Cl. 210—24 **1 Claim**

1. The method of removing urea and/or creatinine of biological origin from aqueous solutions containing the same, which method comprises contacting such aqueous solutions with a polymer selected from the group consisting of

(a) p-Mercapto polystyrene

(b) p-Mercaptoacetic polystyrene

(c) Dinitro-p-mercaptoacetic polystyrene

(d) p-Nitro polystyrene, and

(e) p-Amino polystyrene,

said polymer adsorbing at least some of the urea and/or creatinine from the aqueous solution.

4,178,242

METHOD FOR THE PURIFICATION OF SEWAGE WATERS WHICH CONTAIN ORGANIC COMPOUNDS OF AN ANIONIC CHARACTER

Raffaello Fusco, Milan, Italy, assignor to Anic S.p.A., Palermo, Italy

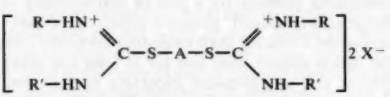
Continuation of Ser. No. 734,189, Oct. 20, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,098

Claims priority, application Italy, Nov. 11, 1975, 29190 A/75

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—54 **1 Claim**

1. A method for the purification of sewage waters containing anionic organic compounds comprising the steps of adding to said water compounds having the general formula:



wherein R and R′ are hydrogen atoms or to lower alkyl groups (C_1–C_3), or R is an alkyl group, a cycloalkyl group, an aralkyl group or an aryl group and R′ a hydrogen atom, A is the residue of an aliphatic linear or branched hydrocarbon, or of an arylaliphatic hydrocarbon, or a residue derived from an aliphatic or mixed aliphatic-aromatic ether or thioether, X^- is an anion such as Cl^-, Br^-, OSO_4H^-, $CH_3SO_3^-$, or $ARSO_3^-$; precipitating said anionic organic compounds from said waters as saline derivatives and separating said waters from the precipitate.

4,178,243

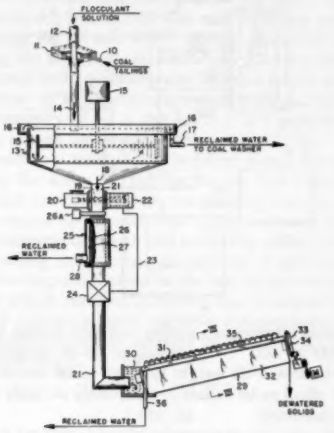
METHOD AND APPARATUS FOR CONTROLLED DEWATERIZING OF COAL TREATMENT UNDERFLOW

Leonard Messer, Pittsburgh, Pa., assignor to American Minechem Corporation, Coraopolis, Pa.

Continuation of Ser. No. 630,214, Nov. 10, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 886,709

Int. Cl.[2] B01D *21/01;* **C02B** *1/20*

U.S. Cl. 210—54 **7 Claims**



1. A method of dewaterizing an aqueous slurry of fine solid particles comprising the steps of:

A. adding a flocculent lyophobic to water and lyophilic to fine solid particles to an aqueous slurry of fine solid particles to form a mixture;

B. charging said mixture to a thickener to separate water from said mixture by settling flocculated solids having a solids content of at least 35 percent;

C. impinging a radiation beam on the flocculated solids transverse the direction of travel of said solids adjacent discharge means from the thickener;

D. detecting with a detector means the impinged radiation to measure the density of the flocculated solids on which the radiation beam impinges and producing from the detector means an electrical signal proportional thereto;

E. automatically regulating and controlling the rate of discharge of the flocculated solids from the thickener with a servovalve positioned in the conduit for discharging said flocculated solids from the thickener, said servovalve being responsive to the electrical signal produced by the detector means; and

F. passing the flocculated solids discharged from the thickener through a foraminal conduit section while vibrating said flocculated solids to remove water therefrom.

4,178,244

PROCESS FOR REMOVAL OF HARDENING AND GALVANIZING WASTE WATER

Helmut Kunst, Hanau, and Georg Wahl, Bergen-Enkheim, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,013

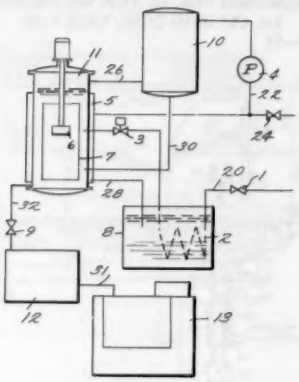
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633772

Int. Cl.[2] C02C *5/00*

U.S. Cl. 210—71 **8 Claims**

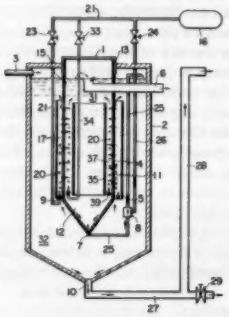
1. In a process for the elimination of toxic cyanide, nitrite, barium compound or heavy metal ions from waste water from a salt bath hardening or galvanizing operation by evaporation

of the toxic material containing waste water and complete detoxification of the evaporated concentrate in a salt bath, said waste water having a salt concentration below 300 g/l, the improvement comprising first evaporating the waste water to a salt concentration of 300 to 500 g/l and then supplying the



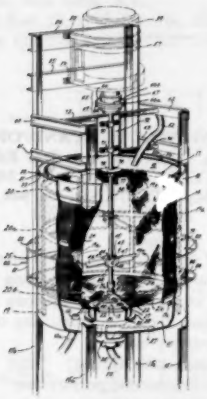
concentrated solution to a molten salt bath having a temperature of 300° to 600° C. consisting of 60–90 weight % alkali metal hydroxide, 5–20 weight % alkali metal nitrate and 5–20 weight % alkali metal sulfate to completely detoxify said evaporated concentrate.

4,178,245
FILTRATION METHOD
Azuma Nakaoka, and Sankichi Takahashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 11, 1974, Ser. No. 514,129
Claims priority, application Japan, Oct. 12, 1973, 48-113950
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—81 **3 Claims**



1. A method of filtering sewage having suspended solids therein, comprising the steps of: passing the sewage through stationary filter material to generally maintain the solids on one side of said filter material and produce filtered water on the opposite side of the filter material; simultaneously passing a stream of gas bubbles along substantially the entire one side of the filter material for causing fluid pressure changes in the sewage around the filter material, and thereby vibrating the filter material continuously as a result of such pressure changes to dislodge the solids from the filter material and prevent clogging of the filter material; positively confining the stream of gas bubbles to flow along and closely adjacent substantially the entire surface of the one side of the filter material, for producing the vibration of the filter material, by means of a shelter member maintained at a fixed close spacing from the one side of said filter material.

4,178,246
SEPARATOR FOR DISCRETE SOLIDS FROM LIQUIDS
Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724
Filed May 31, 1977, Ser. No. 802,252
Int. Cl.[2] B01D *23/26*
U.S. Cl. 210—82 **17 Claims**



17. A method of concentrating and/or separating discrete pieces of solids such as granules, pellets and particles from a suspension, slurry or mixture of them in a liquid medium, which mixture contains a comparatively smaller amount of a substance that provokes blinding of the separation screen of certain filtering means tried for separating said solid pieces from said liquid medium, which method comprises

(a) feeding the aforesaid mixture into a basket-shaped first zone having a vertical cylindrical foraminous bounding surface and a bottom integral with it, said first zone being fixedly positioned coaxially within and (i) radially inwardly spaced away from a vertical cylindrical liquid-tight enclosing surface bounding an open-topped second zone bounded at its bottom by a liquid-tight surface integral with said vertical enclosing surface, and (ii) with the bottom of said first zone being upwardly spaced away from the bottom boundary of said second zone, thereby providing a cup-like portion of said second zone with the vertical annular portion between the vertical boundaries of the first and second zones and the bottom of said second zone being continuous with its annular portion located between the respective bottom portions of said two zones,

(b) while said mixture is accumulating in said first zone and filtrate from the mixture is accumulating in said vertical annular portion, exerting on the mixture circularly applied continuous pressure by a pair of diametrically opposed, rectangularly-shaped pressure-imparting means rigidly carried on a rotating shaft extending vertically coaxially in the basket-shaped zone and for at least the entire height thereof and said pressure imparting means from a level about midway of the lower half of that zone's height extending outwardly from the shaft to an extent of from about one-third to about two-thirds of the radius of that zone, thereby to develop and maintain in said mixture substantially cylindrically laminar movement as it is filling up said first zone and at the same time thereby permitting filtrate from said mixture to pass through said foraminous bounding wall and to accumulate in said second zone to a level therein at least equal to that of the final level of the mixture accumulating in said first zone, and

(c) continuing the feeding of said mixture into said first zone, while said circularly applied pressure is continued to

develop and maintain in the top part of the mixture at least a shallow vortex and with substantially no turbulent agitation and to maintain in said mixture the aforesaid movement, at a rate to maintain the level of filtrate in said second zone at the same as that of the mixture in the first zone while at the same time allowing filtrate to leave from the bottom of said second zone at a rate to allow the filtrate accumulated in the second zone and the mixture accumulated in the first zone to remain at the same level, and

(d) allowing the feeding in of the mixture, the withdrawal of filtrate, application of circularly-acting pressure on the mixture, and maintenance of the described even level in both zones to continue until the maximum possible accumulation of concentrated solids is attained in the first zone (i) when the operation is conducted on a batch basis during the foregoing steps, and (ii) likewise when the operation is conducted on a continuous basis by withdrawing concentrated solids from the bottom of the first zone under conditions avoiding their admixture with the filtrate being discharged during the operation and with the concentrated solids withdrawal, filtrate withdrawal, and mixture feeding conducted each at its respective rate to enable maintaining the level of filtrate in the second zone at least equal to that of the mixture accumulated in the first zone.

4,178,247

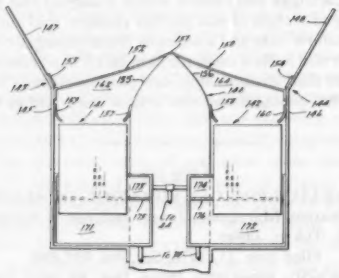
OIL SPILL RETRIEVAL SYSTEM

John J. Janson, Livonia, Mich., assignor to Jan-Bar Retrieval Corporation, Livonia, Mich.

Continuation-in-part of Ser. No. 802,026, May 31, 1977, Pat. No. 4,105,554. This application Aug. 2, 1978, Ser. No. 930,411

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—96.1 **36 Claims**



1. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, screen means including a screen structure located in front of said collecting means to block out debris from said collecting means, said screen means further comprising guide means for providing a funnel like construction for guiding the fluid into an area in front of and along said one side of said boat in relative proximity therewith and to said screen structure, said guide means having at least one gate and with said screen structure defining a V-shape and cooperating with said one gate for directing debris thereto whereby debris can be exited.

36. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, said boat being of a single hull construction with said collecting means comprising a first collecting unit located on one side of said boat and a second collecting unit located on the side of said boat opposite the side on which said first collecting unit is located, said first and second collecting units operable independently of each other for transmitting the mixture of oil and water to said receiving tank means.

4,178,248

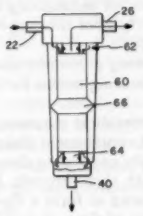
NON-CLOGGING MICROPOROUS FILTER WITH CROSS FLOW OPERATION

Mark C. Porter, Pleasanton, and Wayne P. Olson, San Ramon, both of Calif., assignors to Nuclepore Corporation, Pleasanton, Calif.

Filed Nov. 1, 1977, Ser. No. 847,584

Int. Cl.[2] B01D *27/06*

U.S. Cl. 210—167 **3 Claims**



1. In a liquid filter, a filter cartridge, a shell for containing said filter cartridge, said cartridge having a set of inner and outer edges on opposite sides thereof defining together with said shell an inlet side for accepting material to be filtered and an outlet side opposite thereof for delivering a filtrate, said cartridge being constructed in a cylindrical pleated form in which the filter material is folded back and forth to define said set of inner and outer edges on opposite sides of the cartridge, the folds of said pleated form defining an inner boundary and an outer boundary for said filter located on concentric cylindrical boundaries, first port means forming an inlet port through said shell to the exterior of said inlet side of said cartridge, second port means forming a filtrate outlet on the other side of said filter cartridge and through said shell, third port means forming a bypass outlet through said shell on the inlet side of said cartridge and at a location remote from said first port means, a cylindrical sleeve surrounding a portion of the length of said cartridge in close fitting proximity to its outer boundary and leaving access rings at each end thereof, and means for preventing flow of liquid between said first inlet port and said third bypass port except between said sleeve and said

filter cartridge, means for withdrawing a percentage of inlet liquid from said third port, means forming said bypass outlet to create a flow of liquid tangential to the folds of said filter cartridge on said inlet side, said first port means and third port means are disposed at remote locations so that filterable material passing from the first port means to the third port means flows solely between said inner outer filter cartridge boundaries and along the folds tangentially thereto.

4,178,249

MODULAR CONTAINER

Craig A. Councill, P.O. Box 777-H Rte. 1, Stevensville, Md. 21666

Filed Jun. 13, 1977, Ser. No. 805,866
Int. Cl.[2] B01D *27/02, 15/04*
U.S. Cl. 210—281 **19 Claims**

1. A modular container for maintaining ion-exchange particulate material within a chamber through which contaminated liquid passes, comprising:

(a) housing means having a contaminated liquid inlet and a liquid outlet, said housing means having a predetermined wall thickness;

(b) a pair of containment disks mounted within said housing means, each of said containment disks forming a plurality of rows of alternately undulating elements having a tortuous liquid flow path therethrough, said undulating elements being contoured to form a flow impingement surface in the direction of flow of said liquid throughout a cross-sectional flow area of said liquid, said containment disks and said housing means forming said chamber containing said ion-exchange particulate material, said undulating elements providing said tortuous liquid flow path and dispersal of said contaminated liquid in a transverse direction when taken with respect to said liquid flow prior to impingement; and,

(c) means for positionally mounting said containment disks within said housing means.

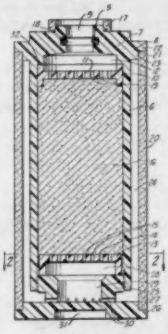
4,178,250

FILTER-PURIFIER CARTRIDGE HAVING MANUALLY SEPARABLE ELEMENTS

Isadore Turetsky, 23940 Welby Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 910,029, May 26, 1978, abandoned. This application Jan. 10, 1979, Ser. No. 2,547
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—315 **5 Claims**

1. A filter-purifier cartridge for liquids having manually separable elements adapted to be inserted in a filter apparatus, comprising: a pervious tubular filter element adapted for radial flow therethrough, a manually separable hollow cylindrical purifier element having inlet and outlet means for flow of fluid therethrough, and containing a purifying medium confined between two foraminous members within the hollow core of said purifier element; said purifier element having a top wall, a concentric discharge passage through said top wall, said passage communicating with the fluid stream within said purifier element; a stepped flange located at the upper end section of the purifier element, said purifier element inserted into the hollow core of said tubular filter element, one end of said tubular filter being sealed and radially spaced from the main



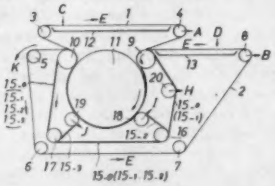
body of said purifier element by means of said stepped flange at the upper end section of said purifier element, thereby forming an intermediate annular channel; the remaining exposed end of said filter element being sealed and maintained in spaced relationship with said purifier element by means of a manually separable cartridge end closure which is aligned and joined to the lower end section of said purifier element, said end closure having a hollow core and a series of radial passages communicating with said hollow core; the annular channel communicating with the fluid stream within said purifier element by means of said radial passages and the hollow core within said end closure.

4,178,251

APPARATUS FOR DEHYDRATION OF SLUDGE

Akitoshi Iwatani, Marugame, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,696
Claims priority, application Japan, Dec. 20, 1977, 52-153719
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—350 **13 Claims**



1. In an apparatus for dehydrating sludge wherein at least one of the two endless belts, each trained around a plurality of rolls, is of water permeable filter medium, sludge feeding means is provided at the beginning of a path of travel of said two endless belts which are caused to run along said path of travel in contiguous relation with each other, said sludge feeding means being adapted to permit sludge to be carried between said two endless belts, and a drum supported in suitable bearings and a pressure belt trained around a plurality of rolls are provided to press said two endless belts in cooperation with

one another in their path of travel around the drum, said drum being in immediate contact with one of said two endless belts, said pressure belt being in immediate contact with the other of said two endless belts, the improvement comprising: said pressure belt being composed of a multiplicity of belt strips arranged in spaced relationship perpendicular to the movement of said two endless belts such that said belt strips do not overlap, said multiple belt strips being positioned along the path of the travel of said two endless belts and in contiguous relation therewith so as to cover any suitable number of stages into which said path of travel is divided.

4,178,252

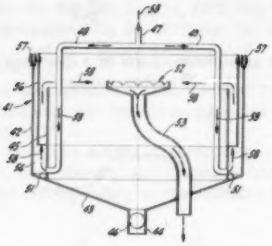
DEVICE FOR SEPARATING PARTICLES FROM A FLUID SUSPENSION AND METHOD FOR SO DOING

Ray B. Krone, 645 Coolidge Street, Davis, Calif. 95616

Filed Aug. 31, 1978, Ser. No. 938,391

Int. Cl.[2] B01D *21/02*

U.S. Cl. 210—521 **1 Claim**



1. A device for separating particles from a fluid suspension comprising a container having an upright, circular-cylindrical, stationary outer wall with a free upper edge; a conical bottom plate at its peripheral edge united with the bottom edge of said outer wall; an upright, circular-cylindrical stationary inner plate disposed within said outer wall and extending to a predetermined height to leave an annular space therebetween; means for holding the lower edge of said inner plate continuously fastened to the edge of said bottom plate; means including orifices in the lower portion of said inner plate for discharging material into said annular space for upward flow therein; an intermediate plate of circular-cylindrical form disposed in said annular space between said outer wall and said inner plate; rollers on said intermediate plate engaging and movable on said upper edge of said outer wall; a weir substantially centered in the space enclosed by said inner plate and disposed at about said predetermined height; and a discharge pipe joined to and communicating with the interior of said weir and extending downwardly through said bottom plate, said inner plate being movable relative to said outer wall with a substantially constant normal distance between said inner plate and said outer wall.

4,178,253

CORROSION INHIBITED LUBRICANT COMPOSITIONS

Peter I. Lee, Prestwood, and Brian Holt, Stretford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

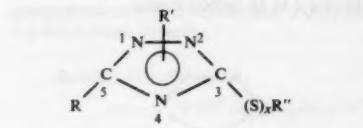
Filed Apr. 3, 1978, Ser. No. 892,711

Claims priority, application United Kingdom, Apr. 5, 1977, 14357/77

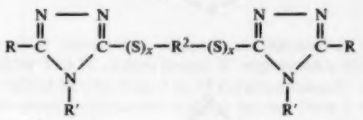
Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47 **6 Claims**

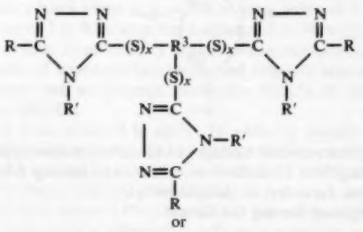
1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity and from 0.001 to 10% by weight, based on the total composition, of a compound of the formula



I

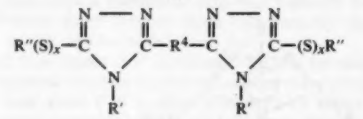


Ia



Ib

or



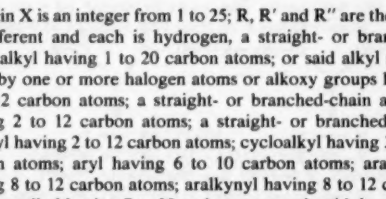
Ic

wherein X is an integer from 1 to 25; R, R′ and R″ are the same or different and each is hydrogen, a straight- or branched-chain alkyl having 1 to 20 carbon atoms; or said alkyl substituted by one or more halogen atoms or alkoxy groups having 1 to 12 carbon atoms; a straight- or branched-chain alkenyl having 2 to 12 carbon atoms; a straight- or branched-chain alkynyl having 2 to 12 carbon atoms; cycloalkyl having 3 to 12 carbon atoms; aryl having 6 to 10 carbon atoms; aralkenyl having 8 to 12 carbon atoms; aralkynyl having 8 to 12 carbon atoms; aralkyl having 7 to 20 carbon atoms; piperidyl, pyridyl; furyl; or said cycloalkyl, aryl, aralkenyl, aralkynyl, aralkyl, piperidyl, pyridyl or furyl substituted by one or more straight or branched alkyl having from 1 to 12 carbon atoms which alkyl groups may be substituted by halogen atoms, by alkoxy having 1 to 12 carbon atoms, by alkylthio having 1 to 18 carbon atoms, by alkylamino having 1 to 24 carbon atoms, by dialkylamino having 1 to 24 carbon atoms, by hydroxy, by cyano or by mixtures of said substituents; or

R is the group—$(S)_xR''$;

or when R and R′ are different from R″,

(a) R″ can be



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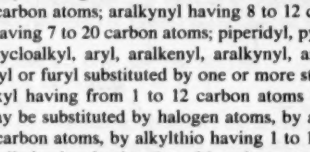
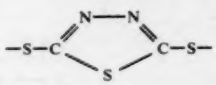


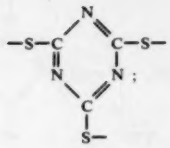
, or

(b) R″ is the ammonium cation or a quaternary ammonium cation having 2 to 22 carbon atoms;

R^2 is

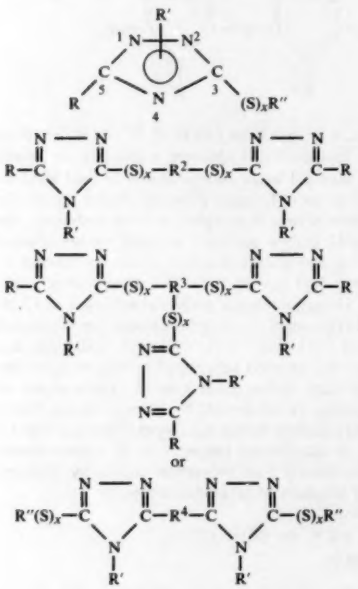


R^3 is



or R^2 and R^4 are alkylene having 1 to 12 carbon atoms; cycloalkylene having 5 to 12 carbon atoms, arylene having 6 to 10 carbon atoms, furandiyl or thiophenediyl.

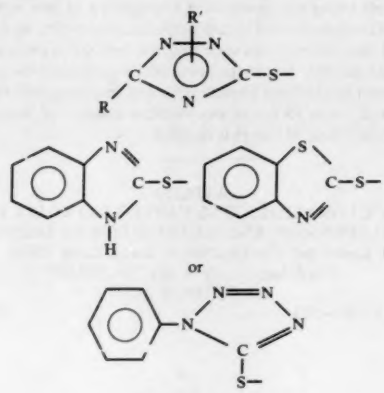
5. A compound having the formula



wherein x is an integer from 2 to 25; R, R′ and R″ are the same or different and each is hydrogen, a straight- or branched-chain alkyl having 1 to 20 carbon atoms; or said alkyl substituted by one or more halogen atoms or alkoxy groups having 1 to 12 carbon atoms; a straight- or branched-chain alkenyl having 2 to 12 carbon atoms; a straight- or branched-chain alkynyl having 2 to 12 carbon atoms; cycloalkyl having 3 to 12 carbon atoms; aryl having 6 to 10 carbon atoms; aralkenyl having 6 to 12 carbon atoms; aralkynyl having 8 to 12 carbon atoms; aralkyl having 7 to 20 carbon atoms; piperidyl, pyridyl; furyl; or said cycloalkyl, aryl, aralkenyl, aralkynyl, aralkyl, piperidyl, pyridyl or furyl substituted by one or more straight or branched alkyl having from 1 to 12 carbon atoms which alkyl groups may be substituted by halogen atoms, by alkoxy having 1 to 12 carbon atoms, by alkylthio having 1 to 18 carbon atoms, by alkylamino having 1 to 24 carbon atoms, by dialkylamino having 1 to 24 carbon atoms, by hydroxy, by cyano or by mixtures of said substituents; or R is the group—$(S)_xR''$;

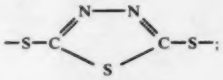
or when R and R′ are different from R″,

(a) R″ can be

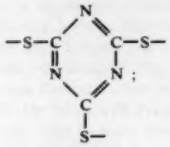


(b) R″ is the ammonium cation or a quaternary ammonium cation having 2 to 22 carbon atoms;

R^2 is



R^3 is



or R^2 and R^4 are alkylene having 1 to 12 carbon atoms; cycloalkylene having 5 to 12 carbon atoms, arylene having 6 to 10 carbon atoms, furandiyl or thiophenediyl.

4,178,254

FABRIC CARE COMPOSITIONS CONTAINING SMECTITE CLAY AND STARCH

John W. Leikhim, Cincinnati, and Sharon J. Mitchell, Forest Park, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,933

Int. Cl.[2] D06M *13/00*

U.S. Cl. 252—8.6 **10 Claims**

1. A fabric care composition comprising:

(a) from about 0.5% to about 75% of a smectite clay selected from the group consisting of alkali metal and alkaline earth metal montmorillonites, saponites, hectorites and mixtures thereof having an ion exchange capacity of at least about 50 meq. per 100 grams;

(b) from about 1% to about 90% of a gelatinized vegetable starch; and

(c) from 0% to about 98% water.

4,178,255

DETERGENT COMPOSITIONS

Joseph F. Stima, Edison; Ronald S. Schreiber, Highland Park, and Annie S. Giordano, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,718
Int. Cl.[2] D06M *13/50*
U.S. Cl. 252—8.8 12 Claims

1. A detergent composition comprising a surface active detergent and metakaolin, the ratio of metakaolin to surface active detergent being at least about 0.8:1.

4,178,256

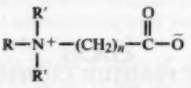
COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423.
This application May 26, 1977, Ser. No. 800,796
Int. Cl.[2] D06M *13/38, 13/40*
U.S. Cl. 252—8.75 18 Claims

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of

I. About 0.5–25% by weight of a softening agent for textile materials, the softening agent being a fatty amphoteric compound corresponding to the structural formula



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R′ is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, and n is about 1–6, the said amphoteric compounds having non-acidic isoelectric ranges;

II. About 3–50% by weight of orthophosphoric acid as an acidic souring agent for laundered textile materials; and

III. About 25–96.5% by weight of water;

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

4,178,257

TIRE BAND PLY LUBRICANT POWDER

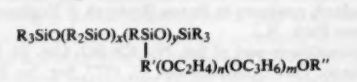
Daniel D. Berry, Bedford Hills, and Richard V. Girardi, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,821
Int. Cl.[2] C10M *3/44, 7/48, 3/04, 7/02*
U.S. Cl. 252—21 18 Claims

1. A water soluble tire band ply lubricant powder consisting of, based upon 100 parts by weight of said powder, (A) from about 63 to about 85.45 parts by weight of an inorganic filler selected from the class consisting of mica particles and a mixture of mica and talc particles, said mixture containing up to 10 parts by weight of talc particles the remainder being mica particles, and containing adsorbed on the surface of said filler,

(B) from about 5 to about 14 parts by weight of a water soluble polyoxyalkylene glycol,

(C) from about 2 to about 6 parts by weight of an organopolysiloxane-polyoxyalkylene copolymer fluid having the average formula:



wherein R represents a monovalent hydrocarbon radical having from 1 to 10 carbon atoms, R′ represents a divalent alkylene radical having from 2 to 18 carbon atoms, R″ represents a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, x has a value of 1 to 300, y has a value of 1 to 25, n has a value of 3 to 50, and m has a value of 3 to 50, with the proviso that at least 10 percent by weight of the polyoxyalkylene chain consists of oxypropylene units, and wherein said siloxane copolymer has an average molecular weight of about 600 to about 100,000,

(D) from about 7 to about 15 parts by weight of a trihydrocarbonsiloxy end-blocked dihydrocarbon siloxane fluid having a viscosity at about 25° C. of from about 200 to about 100,000 centistokes,

(E) from about 0.10 to about 0.35 parts by weight of a nonionic organo substituted cellulosic viscosity controller,

(F) from about 0.10 to about 0.45 parts by weight of an organic anti-bacterial agent, and

(G) from about 0.35 to about 1.2 parts by weight of the aqueous reaction product of an admixture consisting of (i) from about 0.10 to about 0.20 parts by weight of an organosubstituted benzoic acid, (ii) from about 0.15 to about 0.2 parts by weight of an organic amine, and (iii) from about 0.10 to about 0.80 parts by weight of water.

4,178,258

LUBRICATING OIL COMPOSITION

Andrew G. Papay, Manchester, and Edward F. Zaweski, St. Louis, both of Mo., assignors to Edwin Cooper, Inc., St. Louis, Mo.

Filed May 18, 1978, Ser. No. 907,159
Int. Cl.[2] C10M *1/48, 1/38*
U.S. Cl. 252—32.7 E 13 Claims

1. A lubricating oil composition suitable for use in the crankcase of an internal combustion engine, said composition comprising a major amount of mineral oil and a minor wear and friction reducing amount of an oil soluble molybdenum bis(-dialkyldithiocarbamate).

4,178,259

DISPERSANT MANNICH BASE COMPOSITIONS

John M. King, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 1, 1978, Ser. No. 901,919
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 8 Claims

1. A lubricating oil additive selected from a Mannich base condensation product and the alkaline earth metal salts thereof, said Mannich base being prepared by condensing formaldehyde and a polyamine with a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol and (2) from 95 to 60% of phenol alkylated with polyisobutene of 16 to 128 carbon atoms or a mixture of said phenol alkylated with polyisobutene and phenol alkylated with a propylene tetramer.

2. The calcium salt of said Mannich condensation product of claim 1 wherein said polyisobutene contains 32 to 100 carbon atoms.

4,178,260

ESTER BASED METAL WORKING LUBRICANTS

Brian A. Cook, Abingdon, and Thomas W. Brown, Didcot, both of England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 626,662, Oct. 29, 1975, abandoned. This application Jul. 12, 1977, Ser. No. 814,857

Claims priority, application United Kingdom, Oct. 31, 1974, 47154/74

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—49.8 9 Claims

1. A lubricating oil composition comprising a mixture of (i) at least one pentaerythritol tetraester of at least one C_{16} to C_{20} aliphatic open-chain monocarboxylic acid, and (ii) at least one oil-compatible phosphorus compound selected from the group consisting of phosphoric acids, phosphorous acids, and alkyl acid phosphates in which the, or each, alkyl radical contains 1 to 4 carbon atoms; said compound or compounds (ii) being present in total amount of from 0.01 to 0.5 wt.% (calculated as phosphorus) based on the total weight of (i).

3. A composition as claimed in claim 1, wherein the pentaerythritol tetraester is pentaerythritol tetraoleate.

4. A composition as claimed in claim 1, wherein the said constituent (ii) is selected from phosphoric acids and said alkyl phosphates.

5. A composition as claimed in claim 4, wherein constituent (ii) is orthophosphoric acid.

7. A water-emulsifiable lubricating oil composition comprising the composition as defined in claim 1, a conventional emulsifier and a conventional mineral oil.

4,178,261

CARBOXYLIC ACID ESTERS AND THEIR USE AS A BASE LUBRICATING OIL

Rolf Dhein, and Karl-Heinz Hentschel, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

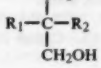
Filed Mar. 22, 1978, Ser. No. 889,118

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713440

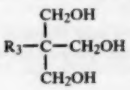
Int. Cl.[2] C10M *1/26;* C11C *3/06*

U.S. Cl. 252—57 6 Claims

1. A carboxylic acid ester preparable by completely or partially esterifying an acid component with a polyhydric alcohol component, said acid component comprising 6-cyclohexylhexanoic acid and up to 75 mol % based on the total acid component of an aliphatic monocarboxylic acid having 4 to 20 carbon atoms and said polyhydric alcohol having at least one member selected from the group consisting of glycerol, dipentaerythritol, a compound of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms and a compound of the formula



wherein R_3 is alkyl having 1 to 6 carbon atoms or hydroxymethyl.

4,178,262

SPOTTING-AGENT COMPOSITION

John W. Compton, Taylor, and Stephen E. Eisenstein, Southfield, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 780,557, Mar. 23, 1977, Pat. No. 4,093,418. This application Aug. 22, 1977, Ser. No. 826,512

Int. Cl.[2] C11D *7/50*

U.S. Cl. 252—162 4 Claims

1. A spotting-agent composition for use in laundering garments which consists essentially of a solution of (1) about 10 weight percent or more of nonionic surfactant produced by reacting a mixture of fatty alcohols containing 10 to 18 carbon atoms (with the proviso that the proportion of such alcohols which is attributable to alcohols containing 17 or more carbon atoms is limited to about 20 percent by weight) with mixed lower-alkylene oxides selected from the group consisting of ethylene oxide and propylene oxide to such an extent as to have the mixed oxides comprise about 57 to 68 weight percent of the total fatty alcohols plus alkylene oxides used, with the proportion of ethylene oxide in the mixed oxides used being about 50 to 70%, in (2) an isoparaffinic solvent made of a mixture of isoparaffins containing an average of about 11 to 14 carbon atoms.

4,178,263

ORGANIC PEROXIDE COMPOSITIONS

Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 758,282, Jan. 10, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,746

Int. Cl.[2] C11D *3/39;* C07C *179/06*

U.S. Cl. 252—186 3 Claims

1. An organic peroxide composition having reduced shock-sensitivity, the composition being consisting essentially of (a) a shock-sensitive organic peroxide and (b) an olefinically unsaturated monomer, the olefinically unsaturated monomer which does not homopolymerize, (a) being present in a proportion of 10 to 90 parts of weight and (b) being present in a proportion of 90 to 10 parts by weight per 100 parts by weight of (a) plus (b).

4,178,264

AIR TREATING GEL COMPOSITION

Allan L. Streit, Hackensack, N.J., and Edward Sansanelli, Rio De Janiero, Brazil, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed Jan. 31, 1978, Ser. No. 873,827

Int. Cl.[2] B01J *13/00;* A61K *7/46;* A61L *13/04*

U.S. Cl. 252—316 7 Claims

1. A thermally stable gel composition comprising in an aqueous system from about 1.5–15%, by weight, of carrageenan and a stearate salt selected rom the group consisting of sodium, potassium and alkanolamine stearates, said carrageenan and stearate being present in a weight ratio of 0.3:1 to 5:1; from about 0.5–6.0%, by weight, of a volatile active agent; from about 1 to 20%, by weight, of a component for enhancing stearate solubility selected from the group consisting of glycols and C_2–C_{18} alcohols; and water to 100%.

4,178,265

OIL COAGULANT AND PROCESS FOR PREPARATION THEREOF

Yoshindo Matsuda; Shigeru Tomita, both of Tokyo; Keiji Abe, Higashi-Kurume, and Kazuki Terajima, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,278

Claims priority, application Japan, Feb. 24, 1977, 52-19440

Int. Cl.[2] B01J *13/00;* **B01D** *17/02;* **C02B** *1/20*

U.S. Cl. 252—316 **29 Claims**

1. An oil coagulant comprising 100 parts by weight of a carboxymethyl yeast mixed with 10 to 150 parts by weight of a polyvalent metal salt of at least one carboxylic acid selected from the group consisting of a fatty acid having 8–22 carbon atoms and an alicyclic carboxylic acid having 8–22 carbon atoms.

12. A process for the preparation of oil coagulants which comprises mixing with (A) a carboxymethylated yeast obtained by carboxymethylating yeast and then heating the carboxymethylated yeast at a temperature within a range of from 50° to 90° C. for 0.5 to 5 hours, either (B) a polyvalent metal salt of at least one carboxylic acid selected from the group consisting of a higher fatty acid having 8 to 22 carbon atoms and an an alicyclic carboxylic acid having 8 to 22 carbon atoms or (C) a mixture capable of forming a polyvalent metal salt of a carboxylic acid comprising at least one carboxylic acid selected from the group consisting of a higher fatty acid having 8 to 22 carbon atoms and an alicyclic carboxylic acid having 8 to 22 carbon atoms, an alkali metal salt, ammonium salt or organic basic salt of said carboxylic acid, and a water soluble polyvalent metal salt of an inorganic acid, in which said (B) polyvalent metal salt of carboxylic acid or said (C) mixture capable of forming a polyvalent metal salt of carboxylic acid is mixed with said (A) carboxymethylated yeast at a compound ratio such that the polyvalent metal salt of carboxylic acid is present in an amount within a range of 10 to 150 parts by weight to 100 parts by weight of said (A) carboxymethylated yeast.

4,178,266

PROCESS FOR CONVEYING HOT CRUDE COKE OVEN GAS FROM COKE OVENS TO A POSITION OF UTILIZATION WHILE PREVENTING CONDENSATION OF HIGHER HYDROCARBONS

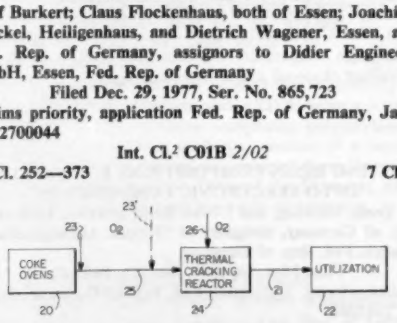
Rudolf Burkert; Claus Flockenhaus, both of Essen; Joachim F. Meckel, Heiligenhaus, and Dietrich Wagener, Essen, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,723

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700044

Int. Cl.[2] C01B *2/02*

U.S. Cl. 252—373 **7 Claims**



1. A process for conveying and treating hot, crude coke oven gas from coke ovens, said process comprising:

discharging hot, crude coke oven gas directly from coke ovens into a conveying means;

conveying said hot, crude coke oven gas through said conveying means, without any preliminary cooling or purification operations, to a thermal cracking reactor;

injecting a first quantity of O_2-containing gas into said coke oven gas within said thermal cracking reactor and thereby thermally cracking said coke oven gas to form a cracked gas;

injecting a second quantity of O_2-containing gas into said coke oven gas within said conveying means, thereby producing a partial combustion of said coke oven gas within said conveying means, and increasing the temperature of said coke oven gas within said conveying means to the reaction temperature of the thermal cracking operation within said thermal cracking reactor, thereby preventing the condensation of higher hydrocarbons from said coke oven gas within said conveying means; and

passing said cracked gas from said thermal cracking reactor to a position of utilization.

4,178,267

PASSIVATING METALS ON CRACKING CATALYSTS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 819,027, Jul. 26, 1977, Pat. No. 4,141,858, which is a continuation-in-part of Ser. No. 671,231, Mar. 29, 1976, abandoned. This application Dec. 15, 1978, Ser. No. 970,078

Int. Cl.[2] B01J *21/20, 29/38, 27/02, 27/14*

U.S. Cl. 252—411 R **15 Claims**

1. A process for passivating metals selected from the group consisting of nickel, iron and vanadium on a catalyst consisting essentially of a clay based cracking catalyst comprising contacting the clay based cracking catalyst with at least one passivating compound selected from the group consisting of antimony selenide, antimony sulfide, antimony sulfate, bismuth selenide, bismuth sulfide and bismuth phosphate under elevated temperature conditions.

9. A process in accordance with claim 1 wherein said passivating compound is antimony selenide.

10. A process in accordance with claim 9 wherein the clay based cracking catalyst and the antimony selenide are intimately mixed with each other and subjected to high temperature and reducing conditions.

4,178,268

SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Roy T. Mitsche, Wauconda, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 795,055, May 9, 1977, Pat. No. 4,124,491. This application Jan. 25, 1978, Ser. No. 872,288

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **8 Claims**

1. In a selectively sulfided catalytic composite comprising a halogenated porous material containing on an elemental basis about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal and rhenium are uniformly dispersed throughout said halogenated porous material; wherein substantially all of said platinum group metal is present in the elemental metallic state; wherein said composite contains sulfur in an amount at least sufficient to provide an atomic ratio of sulfur to rhenium of about 0.5:1 so that a substantial portion of the rhenium is maintained in a sulfided state the improvement, which comprises the presence of Ziegler alumina as said porous material.

4,178,269

HYDROALKYLATION COMPOSITION AND PROCESS FOR PRODUCING SAID COMPOSITION

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 766,640, Feb. 8, 1977, Pat. No. 4,094,920.
This application Dec. 30, 1977, Ser. No. 866,135
Int. Cl.[2] B01J *27/06, 29/06*
U.S. Cl. 252—441 16 Claims

1. A composition comprising:

at least one platinum compound supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite which additionally has a halide content ranging from about 0.5 to about 10 milligrams of elemental halogen per gram of said composition,

wherein the rare earth content of the calcined, acidic, nickel and rare earth-treated crystalline zeolite is in the range of from about 2 to about 25 percent by weight of said composition; and

wherein the nickel content of the calcined, acidic nickel and rare earth-treated crystalline zeolite is in a range of from about 0.01 to about 15 percent by weight of said composition.

4,178,270

METHOD FOR SUPPORTING HYDROUS METAL OXIDE ON CARRIER

Kazunori Fujita, Tokaimura; Seiji Takeuchi, Hitachiota; Hisao Yamashita, and Fumitɔ Nakajima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 1, 1978, Ser. No. 882,334
Claims priority, application Japan, Mar. 1, 1977, 52/20877
Int. Cl.[2] C02B *1/44*
U.S. Cl. 252—447 10 Claims

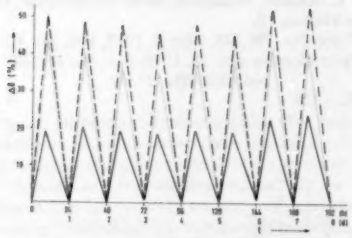
1. A method for supporting a hydrous metal oxide on a carrier, which comprises hydrolyzing a metal salt near a surface of carrier in a pH range causing hydrolysis of the metal salt and allowing zeta potentials of the carrier and hydrous oxide of metal to have opposite polarities to each other.

4,178,271

SHEET-LIKE STRUCTURE OF POLYVINYL CHLORIDE, WHICH IS CAPABLE OF ABSORBING WATER VAPOR AND TRANSMITTING WATER VAPOR

Walter Busch; Arno Holst, both of Wiesbaden, and Wilhelm Fischer, Pirmasens, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,447
Claims priority, application Luxembourg, Dec. 24, 1976, 76471
Int. Cl.[2] C08L *1/28, 3/08*
U.S. Cl. 260—17 R 3 Claims



1. In a sheet-like structure of polyvinyl chloride or a copolymer of vinyl chloride, which is capable of absorbing water vapor and transmitting water vapor, with a uniformly incorporated additive,

the improvement comprising that said additive is composed of polymeric particles of at least one modified starch ether or cellulose ether, which has been modified by cross-linking, effected by means of heat energy, radiation or an additional chemical compound, which is insoluble in water to the extent of at least 50% by weight, and which is swellable in aqueous liquids.

4,178,272

HOT-MELT ADHESVIES FOR BONDING POLYETHYLENE

Max F. Meyer, Jr.; Richard L. McConnell, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,565
Int. Cl.[2] C08L *93/00, 23/14*
U.S. Cl. 260—27 R 8 Claims

1. An adhesive composition capable of being used as a hot-melt adhesive comprising a blend of

(1) 35 to 88 weight percent substantially amorphous poly(-propylene-co-higher 1-olefin), in which the 1-olefin is a member of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene, and 1-decene, having a melt viscosity of about 10,000 to about 200,000 cp. at 190° C.,

(2) 10 to 50 weight percent of at least one tackifying resin having a softening point of at least 100° C. selected from the group consisting of hydrocarbon resins, polyterpene resins, and rosin esters, and

(3) 2 to 15 weight percent crystalline polypropylene or crystalline propylene/ethylene copolymers containing not more than 20 percent by weight ethylene, said polypropylene or propylene/ethylene copolymer having a melt viscosity of about 100 to 100,000 cp. at 190° C.

4,178,273

FIREPROOF BARRIER COATING COMPOSITIONS

William F. Brown, Wausau, Wis., assignor to Wausau Homes, Inc., Wausau, Wis.

Filed Oct. 10, 1978, Ser. No. 949,660
Int. Cl.[2] C08L *61/24*
U.S. Cl. 260—29.4 UA 5 Claims

1. A composition adapted for coating the surface of a substrate and providing thereon an adherent, fireproof barrier coating, said composition comprising an aqueous dispersion containing vinyl acetate, titanium dioxide, pumice, zinc oxide, sodium silicate, hydrated magnesium aluminum silicate, a comminuted high temperature fluorocarbon resin, a furan resin, comminuted charcoal and a dispersing agent.

4,178,274

CASTING RESIN COMPOSITIONS FOR SEALING OPTO-ELECTRONIC COMPONENTS

Hans Denk, Gauting, and Ulrike Reeh, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,432
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642465
Int. Cl.[2] C08K *5/09, 5/10*
U.S. Cl. 260—31.8 E 15 Claims

1. An acid anhydride-hardenable, epoxy-based casting resin composition which is liquid at room temperature comprising:

(a) at least one epoxy compound having a cycloaliphatic base and at least two oxiran rings;

(b) at least one carbonic acid anhydride;

(c) a zinc octoate; and

(d) a solvent selected from the group consisting of a low molecular weight polyol, a low molecular weight acid ester and mixtures thereof.

4,178,275
BLOCK COPOLYMERS OF DIENES AND HYDROCARBYL-SUBSTITUTED STYRENES AS ADHESIVES

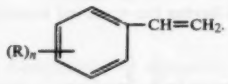
Henry L. Hsieh, and Floyd E. Naylor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 636,488, Dec. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 141,996, May 10, 1971, abandoned. This application Jul. 7, 1977, Ser. No. 813,583

Int. Cl.[2] **C08K** *5/01, 5/02, 5/06, 5/07*

U.S. Cl. 260—33.6 A **13 Claims**

1. An adhesive composition comprising a block copolymer consisting essentially of radial copolymer of a conjugated diene styrene and a hydrocarbyl-substituted styrene of the formula



in which R is a hydrocarbon radial containing 1 to 12 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl, and combinations thereof and n is an integer having a value within the range of 1 to 5, said block copolymer having an inherent viscosity within the range of from about 0.5 to about 3, said conjugated diene containing 4 to 12 carbon atoms per molecule, a tackifier, and an organic liquid solvent, and wherein said block copolymer, based on 100 parts by weight of copolymer, contains from about 50 to about 90 parts by weight of said conjugated diene and from about 50 to about 10 parts by weight of said styrene and hydrocarbyl-substituted styrene and the amount of said hydrocarbyl-substituted styrene to the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene is within the range of from about 1 to about 20 parts by weight of said hydrocarbyl-substituted styrene per 100 parts by weight of the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene.

4,178,276
MOLD CORROSION INHIBITION

Robert S. Shue, and Donald L. Crain, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 21, 1978, Ser. No. 972,085

Int. Cl.[2] **C08L** *81/04*

U.S. Cl. 260—37 R **13 Claims**

1. A method for forming shaped products of normally solid poly(arylene sulfide) resin comprising (1) forming a poly(arylene sulfide) resin composition comprising poly(arylene sulfide) resin and a corrosion inhibiting amount of at least one metal oxalate wherein the metal is selected from Groups IA, IIA, and IIB of the Periodic Table of the Elements, and (2) molding said poly(arylene sulfide) resin composition.

4,178,277
MODIFIED POLYESTERS

Peter Gebauer; Wilhelm Kaüfer; Herbert Klinkenberg, and Hilde Söntgerath, all of Troisdorf, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,474

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727486

Int. Cl.[2] **C08L** *67/02;* **C08G** *63/76*

U.S. Cl. 260—40 R **34 Claims**

1. A modified polyester composition consisting essentially of the condensation product of a reaction mixture consisting essentially of a copolymer of terephthalic acid or a polyester forming derivative thereof, an aliphatic, cycloaliphatic or other aromatic dicarboxylic acid or its polyester forming derivative wherein the terephthalic acid or its polyester forming derivative comprises at least 50 mole percent based upon the combined amounts of acids or their polyester derivatives and a mixture of diols comprising at least 50 mole percent, based upon the combined amounts of diols, of butane diol-1,4, said copolymer having an arithmetical mean molecular weight M_n of more than 17,000 and up to 40,000, a carboxyl equivalent of at least 10 m Val/kg, a nitrogen content of less than 0.4 weight percent and urethane groups linked linearly to said copolymer.

19. A molding composition comprising the modified polyester of claim 1 and an additive.

20. A composition according to claim 19 wherein said said additive is a filler and said filler is present in an amount of 2 to 80 weight percent.

22. A composition according to claim 20 wherein said filler in glass sphere, glass powder, glass whiskers, asbestos fibers, carbon fibers, synthethic fibers, metal threads, metal chips, metal powder or mixtures thereof.

4,178,278
FRICTION MATERIAL FOR RAILROAD SERVICE

Harold J. Reynolds, Jr., Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 882,504, Mar. 1, 1978, abandoned. This application Jun. 26, 1978, Ser. No. 918,977

Int. Cl.[2] **C08K** *3/04, 3/08*

U.S. Cl. 260—42.22 **36 Claims**

1. A friction material composition suitable for use as a brake shoe for railroad service

(a) which comprises, in percent by volume:

organic component	30–60%
steel fibers	1–12%
carbonaceous component	5–30%
inorganic fillers	5–35%
additives	1–7%

(b) which also contains no lead metal, lead compounds or asbestos fiber; and

(c) wherein said organic component comprises rubber in an amount of at least 20% by volume of the composition.

4,178,279
PERMANENTLY STABILIZED POLYURETHANES

Paul Uhrhan, Cologne; Harald Oertel, Odenthal; Reinhard Lantzsch, Cologne; Ernst Roos, Odenthal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,762

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642374

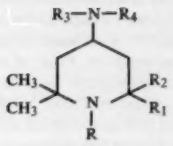
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.

Int. Cl.[2] **C08K** *5/34, 5/20*

U.S. Cl. 260—45.8 N **9 Claims**

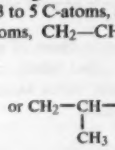
2. A process for the preparation of a permanently stabilized polyurethane which comprises incorporating a derivative of 2,2,6,6-tetraalkyl-piperidine having an active hydrogen-containing group in a reaction mixture used for the preparation of the polyurethane.

4. The process according to claim 2, wherein the derivative of 2,2,6,6-tetraalkyl-piperidine is represented by the following general formula:



wherein

R denotes hydrogen, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, an alkenyl group having from 3 to 5 C-atoms, an aralkyl group having from 7 to 12 C-atoms, CH_2—CH_2—CN, CH_2—CH_2—COO-alkyl



R_1 and R_2, which are identical or different, each denote a straight chain or branched chain alkyl group having from 1 to 6 C-atoms or, together with the ring carbon atoms to which they are attached, a cycloalkyl ring having from 5 to 7 C-atoms,

R_3 denotes hydrogen, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, a cycloalkyl group having from 5 to 12 C-atoms, an aralkyl group having from 7 to 12 C-atoms, an ω-cyanoalkyl group or a β-alkoxycarbonylalkyl group having from 1 to 3 C-atoms in the alkoxy part,

R_4 denotes hydrogen, CO—NH—NH_2 or, when R_3=H, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, a cycloalkyl group having from 5 to 12 C-atoms, an aralkyl group having from 7 to 12 C-atoms, an ω-cyanoalkyl group or a β-alkoxycarbonylalkyl group; or when R_3 is not H, an ω-aminoalkyl, an ω-N-alkylaminoalkyl, an ω-hydroxyalkyl or an ω-carboxylic acid hydrazidoalkyl group, and when R_3 and R_4 do not carry an active hydrogen-containing group, R may also denote an ω-aminoalkyl, β-hydroxyalkyl or β-carboxylic acid hydrazidoalkyl group.

4,178,280

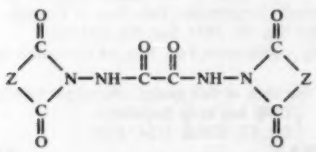
STABILIZED POLYOLEFIN COMPOSITION

Harry E. Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 668,842, Mar. 22, 1976, Pat. No. 4,100,132.
This application Apr. 4, 1978, Ser. No. 893,466
Int. Cl.[2] C08K *5/34, 5/30;* **C07C** *109/087*
U.S. Cl. 260—45.8 A **28 Claims**

1. A compound selected from the group consisting of

(a) a dimethyl sulfoxide complex of a compound having the structural formula:

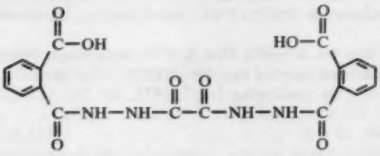


(I)

wherein Z is a bivalent radical having at least one C—C double bond and is selected from the group consisting of phenylene, vinylene, cyclohexenylene, cyclchexenylene substituted by a methyl group and norbornenylene;

(b) a tertiary amide complex of the compound of the structural formula (I) wherein Z is a bivalent radical having at least one C—C double bond and is selected from the group consisting of phenylene, vinylene, cyclohexenylene, cyclohexenylene substituted by a methyl group and norbornenylene;

(c) a compound having the structural formula:

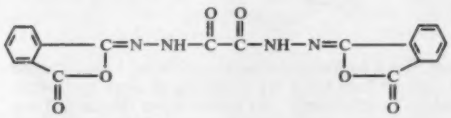


(II);

(d) a tertiary amide complex of the compound of structural formula (II);

(e) the hydrated enol form of the compound of the structural formula (I) wherein Z is phenylene;

(f) a compound having the structural formula:



(III);

and mixtures thereof.

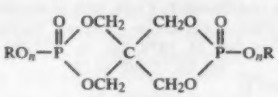
4,178,281

FLAME-RETARDANT POLYCARBONATE COMPOSITIONS

William E. Horn, Jr., Vincent, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 30, 1978, Ser. No. 910,258
Int. Cl.[2] C08K *5/02, 5/06, 5/52, 5/53*
U.S. Cl. 260—45.8 R **13 Claims**

1. An aromatic polycarbonate composition containing a minor proportion of at least one phosphorus compound having the structural formula:



wherein R is alkyl of 1–8 carbon atoms or aryl of 6–20 carbon atoms and n is 0 or 1.

4,178,282

VINYL RESIN STABILIZER

Kook J. Bae, East Northport, N.Y., assignor to Claremont Polychemical Corporation, Bethpage, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,107
Int. Cl.[2] C08K *5/09, 5/52, 5/13*
U.S. Cl. 260—45.75 W **44 Claims**

1. A stabilizer composition especially adapted for use as a stabilizer for halogenated hydrocarbon resins which comprises at least one alkali metal salt of an organic acidic compound selected from the group consisting of carboxylic acids and phenols, at least one alkaline earth metal salt of an organic acidic compound selected from the group consisting of carboxylic acids and phenols, zinc chloride dissolved in an organic hydroxyl containing compound or an organic diphosphite, at least one organophosphite, and at least one inert organic solvent therefor.

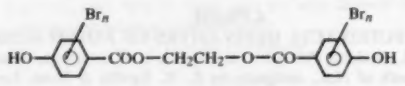
4,178,283

COMPOUNDS FOR OBTAINING POLYMERIC FLAMEPROOFING AGENTS AND THE PROCESS FOR OBTAINING THEM, AS WELL AS THE FLAMEPROOFING AGENTS THUS OBTAINED

Paul Couchoud, Dardilly, France, assignor to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 790,997, Apr. 26, 1977, Pat. No. 4,117,042. This application Mar. 8, 1978, Ser. No. 884,587
Claims priority, application France, May 5, 1976, 76 13664
Int. Cl.[2] C08K *5/53;* C07C *69/84*
U.S. Cl. 260—45.85 R 3 Claims

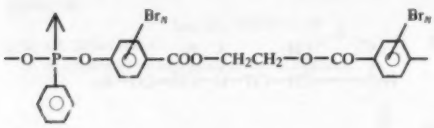
1. A phenol having the formula:



(I)

wherein n is 2.

2. Polyester flameproofed by admixture with an aromatic polyphenylphosphonate consisting of recurring units of the formula:



(II)

in which n equals 0 or 2.

4,178,284

OCTAPEPTIDES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,658
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 10 Claims

1. A compound of the formula

H-Tyr-X_1-Gly-Phe-X_2-Lys-Gly-X_3-OH

in which
X_1 is Gly or D-Ala
X_2 is Met, Leu, D-Met or D-Leu, and
X_3 is Glu or Gln
or a pharmaceutically acceptable salt thereof.

4,178,285

SEPARATION OF ACTIVE α_1-ACID GLYCOPROTEIN AND UTILIZATION IN THE LIPOPROTEIN LIPASE ENZYME SYSTEM

James M. Felts, 2299 Pacific Ave. #62, San Francisco, Calif. 94115, and Ilona Staprans, 2052 20th St., San Francisco, Calif. 94117

Filed Dec. 20, 1978, Ser. No. 971,484
Int. Cl.[2] C07G *7/00, 15/00*
U.S. Cl. 260—112 R 4 Claims

1. A method of separating the active α_1-acid glycoprotein fraction, which contains a co-factor in the lipoprotein lipase reaction, from nephrotic urine as follows:
(a) concentrate the said urine to about 10–20% by volume;
(b) precipitate undesired protein at pH 4 with ammonium sulfate;
(c) recover the α_1-acid glycoprotein fraction from the supernatant, neutralize with solid $NaHCO_3$, and purify by dialysis versus H_2O and lyophilize.

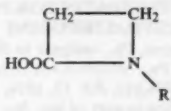
4,178,286

β-LACTAMS, THEIR PRODUCTION, INTERMEDIATES THERETO AND DERIVATIVES THEREOF

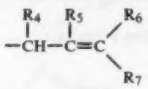
Harry H. Wasserman, and Bruce H. Lipshutz, both of New Haven, Conn., assignors to Research Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,343
Int. Cl.[2] C07D *205/08, 405/06*
U.S. Cl. 260—239 A 7 Claims

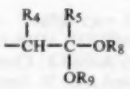
1. A process for preparing a lactam from an aminocarboxylic acid of the formula



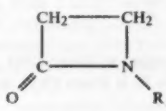
where R_1 is selected from the group consisting of:
(a) an alkenyl group of the formula



wherein R_4 is phenyl, phenylalkyl of 1–4 carbon atoms in the alkyl group or phenylalkenyl of 2–4 carbon atoms in the alkenyl group, each of which is unsubstituted or monosubstituted by lower alkyl, lower alkoxy or halogen; and R_5, R_6 and R_7 are hydrogen or alkyl of 1–3 carbon atoms; and
(b) an acetal of the formula



wherein R_4 and R_5 have the above-indicated values while R_8 and R_9 are each alkyl of 1–6 carbon atoms or together form ethylenedioxy or propylenedioxy;
which comprises oxygenation of a dianion formed at low temperatures by reacting said aminocarboxylic acid with a non-nucleophilic base whose corresponding conjugate acid has a pKa equal to or greater than 19 in a polar, aprotic solvent to form a corresponding dianion intermediate and acidification of said intermediate to form a corresponding lactam of the formula



wherein R_1 has the above-indicated values.

4,178,287

PROCESS FOR THE PURIFICATION OF CAPROLACTAM BY MEANS OF OZONE

Roberto Mattone, Frascati, and Mario Catoni, Colleferro, both of Italy, assignors to SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Continuation of Ser. No. 782,092, Mar. 28, 1977, abandoned. This application Dec. 12, 1978, Ser. No. 968,807
Claims priority, application Italy, Apr. 9, 1976, 22108 A/76
Int. Cl.[2] C07D *201/16*
U.S. Cl. 260—239.3 A 5 Claims

1. In a process for the purification of caprolactam from

oxidizable impurities present therein, by treatment with an oxidizing agent, the improvement which comprises dissolving caprolactam containing oxidizable impurities in water to form an aqueous solution and contacting said aqueous solution with ozone as said oxidizing agent, the ozone:caprolactam ratio being between about 150 to 1500 milligrams of ozone per kilogram of caprolactam.

4,178,288

SULFAMINOALKYL SUBSTITUTED TETRAZOLE THIOL INTERMEDIATES FOR PREPARING CEPHALOSPORINS

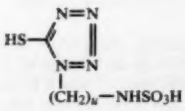
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 704,142, Jul. 12, 1976, Pat. No. 4,118,491, which is a continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 14, 1978, Ser. No. 924,523

Int. Cl.[2] C07D *257/04*

U.S. Cl. 548—251 **2 Claims**

1. A compound of the formula:



in which n is two to five.

4,178,289

CARBAZOLE ACETIC ACID DERIVATIVES

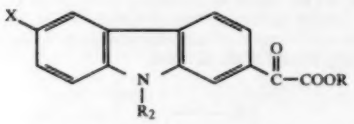
Leo Berger, Montclair; Alfred J. Corraz, Wayne; David R. Parrish, Glen Ridge, and John W. Scott, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 919,010, Jun. 26, 1978. This application Jan. 11, 1979, Ser. No. 2,486

Int. Cl.[2] C07D *209/86*

U.S. Cl. 260—315 **9 Claims**

1. A compound of the formula



(a)

wherein R is hydrogen or lower alkyl, R_2 is hydrogen or R_1OC—, wherein R_1 is lower alkyl, and X is hydrogen or chlorine.

9. 6-Chloro-α-methylenecarbazole-2-acetic acid.

4,178,290

DITHIINOACETIC ACID AND ITS PREPARATION

Christian Berger, Le Plessis Robinson; Dominique Deprez, Longjumeau; Daniel Farge, Thiais; Claude Moutonnier, Le Plessis Robinson, and Gerard Wolff, Vitry, all of France, assignors to Rhone-Poulenc Industries, Paris, France

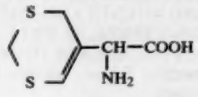
Filed Jun. 6, 1978, Ser. No. 913,088

Claims priority, application France, Jun. 9, 1977, 77 17663; Mar. 29, 1978, 78 09042; Mar. 30, 1978, 78 09224

Int. Cl.[2] C07D *339/08*

U.S. Cl. 549—22 **5 Claims**

1. The 1,3-dithiinoacetic acid of the formula:



in which the amine function is free or protected by a tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl radical, in its D, L and D,L forms.

4,178,291

SUBSTITUTED ACYL DERIVATIVES OF AMINO ACIDS

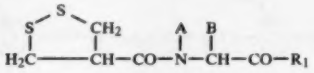
Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 889,769, Mar. 24, 1978, Pat. No. 4,154,936, which is a division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Dec. 4, 1978, Ser. No. 966,284

Int. Cl.[2] C07D *339/04*

U.S. Cl. 549—39 **2 Claims**

1. A compound of the formula



wherein

R_1 is hydroxy or lower alkoxy;

A is hydrogen, lower alkyl or hydroxy-lower alkylene; and

B is hydrogen, lower alkyl, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene, carbamoyl-lower alkylene or carboxy lower alkylene.

4,178,292

PROCESS FOR THE PREPARATION OF OXAZIRIDINE

Pierre Tellier, Oullins, and Francis Weiss, Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 412,407, Nov. 2, 1973, abandoned. This application Oct. 23, 1975, Ser. No. 625,113

Claims priority, application France, Nov. 3, 1972, 72.38897

Int. Cl.[2] C07D *273/00, 413/04*

U.S. Cl. 260—333 **3 Claims**

1. In the method of preparing oxaziridine which consists of reacting hydrogen peroxide with an azomethinic derivative or with a mixture of a carbonyl compound and a primary amine in the presence of a hydrogen peroxide catalyst, the improvement comprising carrying out the reaction in the presence of catalytic amounts of selenium or of oxygenated compounds of selenium.

4,178,293

ISOINDOLINYL DERIVATIVES

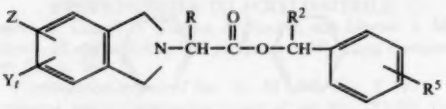
Clive A. Henrick; Robert L. Carney, and Jeffrey N. Labovitz, all of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 896,261, Apr. 14, 1978, abandoned. This application Jun. 12, 1978, Ser. No. 915,045

Int. Cl.[2] A01N *9/22;* **C07D** *209/44, 217/04*

U.S. Cl. 260—326.1 **18 Claims**

1. A compound of the formula:



wherein,
R is isopropyl;
R^2 is hydrogen, cyano, methyl or ethynyl;
R^5 is phenoxy;
Z is hydrogen, bromo, chloro or fluoro;
Y is bromo, chloro, fluoro or trifluoromethyl; and
t is zero, one, two or three; and the salts thereof of strong inorganic acids or organic acids.

4,178,294

p-TRIMETHYLSILYLOXYPHENYL GLYCYLOXY SUCCINIMIDE

Erling Guddal, Skovlunde, Denmark, assignor to Novo Industri A/S, Bagsvaard, Denmark

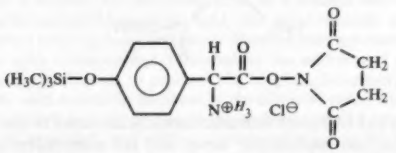
Division of Ser. No. 693,516, Jun. 7, 1976, Pat. No. 4,098,796. This application Nov. 2, 1977, Ser. No. 847,855

Claims priority, application United Kingdom, Jun. 13, 1975, 25447/75

Int. Cl.² C07F *7/18*

U.S. Cl. 260—326.4 **1 Claim**

1. A chemical compound of the formula:



4,178,295

METHOD OF PREPARING PHTHALIDE

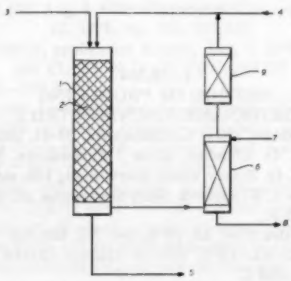
Fritz Englaender, Bonn-Bad Godesberg, and Fritz Robert Kappler, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,201

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720929

Int. Cl.² C07D *307/88*

U.S. Cl. 260—343.3 R **9 Claims**



1. In a process for preparing phthalide by contacting chlorophthalide with hydrogen in the presence of a catalyst at a temperature between 50° and 350° C., the improvement which consists essentially of flowing chlorophthalide continuously in the fluid form through a fixedly disposed solid catalyst bed of grain size 1 to 12 mm, passing a stoichiometric excess amount of hydrogen gas therethrough at such rate so as to sweep off hydrogen chloride formed as a by-product and withdrawing phthalide from said reactor in fluid form and continuously withdrawing hydrogen gas and hydrogen chloride from said reactor.

4,178,296

INSECT PHEROMONE

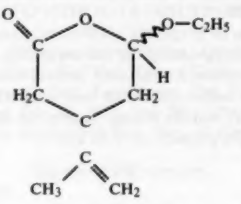
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 836,324, Mar. 13, 1978. This application Nov. 24, 1978, Ser. No. 963,535

Int. Cl.² C07D *309/30*

U.S. Cl. 260—343.5 **1 Claim**

1. The compound of the formula:



4,178,297

PREPARATION OF UNSATURATED ALCOHOLS AND INTERMEDIATES THEREIN

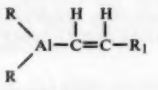
Spencer C. Watson; Dennis B. Malpass, and G. Scott Yeargin, all of La Porte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Continuation of Ser. No. 739,780, Nov. 8, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,360

Int. Cl.² C07D *307/00*

U.S. Cl. 260—346.11 **4 Claims**

1. A composition comprising predominantly the cis-isomer of a compound having the generic formula:



wherein R can be the same or different and is selected from a straight or branched chain alkyl group having from 1 to 6 carbon atoms; R_1 is selected from a straight or branched chain alkyl group having from 1 to 20 carbon atoms; and at least a molar equivalent of a stabilizing Lewis base coordinating agent selected from tetrahydrofuran, tetrahydropyran and dioxane.

4. A composition of claim 1 wherein the coordinating agent is tetrahydrofuran.

4,178,298

PROCESS FOR PREPARING MALEIC ANHYDRIDE

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Division of Ser. No. 799,331, May 23, 1977. This application Oct. 12, 1977, Ser. No. 841,533

Claims priority, application Switzerland, May 21, 1976, 6466/76

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **12 Claims**

1. Process which comprises converting a straight-chain C_4-hydrocarbon in the gaseous phase to maleic anhydride using an activated catalyst, which can be reactivated, for oxidation reactions on the basis of a mixed oxide of vanadium and

phosphorus, said vanadium having an average valence of less than +3.9, said catalyst having been activated at a temperature of 300° to 450° C. by passing over the mixed oxide a gaseous hydrocarbon component, which has 2 to 6 carbon atoms, in the absence of molecular oxygen, said catalyst having been calcined before activation, and said catalyst having an atomic ratio of phosphorus to vanadium between 1.05 to 1 and 1.10 to 1.

4,178,299

PROCESS FOR PREPARING 1,3-DIACYL GLYCEROLS

Daniel A. Dunnigan, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 27, 1978, Ser. No. 890,433
Int. Cl.[2] C11C *3/12*; C09F *5/08*
U.S. Cl. 260—409 **10 Claims**

1. The process of preparing a 1,3-diacylglycerol consisting essentially in hydrogenating the corresponding 1,3-dialkanoylacetone in the presence of an inert neutral solvent and finely divided metallic ruthenium on an inert support at a temperature between 0° C. and the boiling point of the reaction mixture and at a hydrogen pressure of 0–30 atm.

4,178,300

SOLUTIONS OF ORGANIC MAGNESIUM COMPOUNDS CONTAINING OXYGEN IN HYDROCARBONS

Cornelis E. P. V. van den Berg, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 31, 1978, Ser. No. 957,002
Claims priority, application Netherlands, Oct. 31, 1977, 7711923
Int. Cl.[2] C11C *1/00*; C07C *51/00, 27/00*
U.S. Cl. 260—413 **17 Claims**

1. A process for the preparation of low viscosity solutions of organooxy magnesium compounds, in which the organic radicals attached to magnesium by way of an oxygen atom contain from 3 to 30 carbon atoms each, and together at least 7 carbon atoms, which consists essentially in dissolving said compound in a hydrocarbon solvent in the presence of at least 5 mol %, calculated to the magnesium compound, of an organooxy transition metal compound from Groups IV through VI of the Periodic Table.

4,178,301

BENZOIC ACID DERIVATIVES

Tellis A. Martin, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 889,667, Mar. 24, 1978, Pat. No. 4,132,802, which is a division of Ser. No. 733,598, Oct. 18, 1976, Pat. No. 4,096,277, which is a division of Ser. No. 579,650, May 21, 1975, Pat. No. 4,005,222. This application Oct. 16, 1978, Ser. No. 952,034
Int. Cl.[2] C07C *153/11*
U.S. Cl. 260—455 R **1 Claim**

1. 4-[2-(Acetylthio)acetamido]benzoic acid.

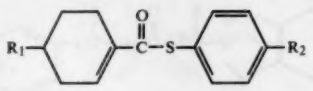
4,178,302

NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Hisato Sato, Tokyo; Haruyoshi Takatsu, Kodaira, and Masayuki Tazume, Urawa, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,618
Claims priority, application Japan, Apr. 11, 1978, 53-41787
Int. Cl.[2] C07C *153/11*
U.S. Cl. 260—455 R **21 Claims**

1. A compound of the formula



wherein R_1 represents a linear alkyl group containing 3 to 7 carbon atoms and R_2 represents a linear alkoxy group containing 2 to 5 carbon atoms.

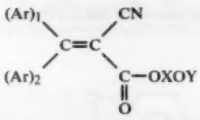
4,178,303

(2-CYANO-3,3-DIPHENYLACRYLOXY) ALKYLENE ACRYLIC ACID ESTERS

Donald H. Lorenz, Basking Ridge, and Bruce A. Gruber, Bloomingdale, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,787
Int. Cl.[2] C07C *121/70*
U.S. Cl. 260—465 D **11 Claims**

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where

$(Ar)_1$ and $(AR)_2$ are aromatic carbocyclic nuclei of the benzene and naphthalene series and are independently selected from phenyl or phenyl substituted with alkyl, halo, alkoxy, carboxy, carbalkoxy, cyano, acetyl, benzoyl, phenyl, alkyl phenyl, phenoxy phenyl, alkyl substituted phenoxy, or alkoxy phenyl substituted phenyl, and naphthyl;

X is alkylene, C_2–C_{17}, unsubstituted or substituted with halo, cyano, alkyl C_1–C_6, alkoxy C_1–C_6, alkoxyalkyl C_1–C_6 or alkoxyalkyleneoxy C_1–C_6; and,

Y is a copolymerizable radical selected from acryloyl C_3–C_{12}, alkylacryoyl C_3–C_{12}, acryloxyalkyl C_3–C_{12}, acryloxyhydroxyalkyl C_3–C_{12} and alkylacryloxyhydroxyalkyl C_3–C_{12}.

4,178,304

METHOD OF PRODUCING ORTHO-AMINOBENZONITRILE

Jury N. Litvishkov, ulitsa Gadzhibekova, 37-43, blok 3, kv. 44; Medzhid R. O. Efendiev, ulitsa 2 Zavodskaya, 9/1, kv. 24; Ramiz G. K. O. Rizaev, ulitsa Sharif-Zade, 148, blok 5, kv. 67, and Khalida Y. K. Kulieva, ulitsa Shaumiana, 28, kv. 27, all of Baku, U.S.S.R.

Filed Mar. 13, 1978, Ser. No. 885,366
Int. Cl.[2] C07C *121/78, 120/00, 120/14*
U.S. Cl. 260—465 E **4 Claims**

1. Method of producing ortho-aminobenzontrile, which comprises reacting ortho-toluidine with ammonia at a temperature of 360°–460° C. in the presence of oxygen, or a mixture thereof with inert gases, and a catalyst consisting essentially of a mixture of oxides of vanadium, antimony, bismuth, and phosphorus applied to a support, said oxides being present in a ratio by weight of 5–12:3–9:1–9:0.5–4, respectively.

4,178,305

OXIDATIVE DEHYDROGENATION OF PROPIONITRILE TO ACRYLONITRILE

Charles R. Campbell; William A. Heckle, and Marion J. Mathews, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 857,835, Dec. 5, 1977, abandoned, and a continuation-in-part of Ser. No. 732,556, Oct. 15, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,984

Int. Cl.[2] C07C *120/00, 121/32*

U.S. Cl. 260—465.9 6 Claims

1. A primarily oxidative process for dehydrogenation of propionitrile to acrylonitrile comprising subjecting propionitrile to a temperature of about 725°–900° C. in a reaction medium consisting essentially of the propionitrile, a metal oxide oxygen donor, and an alumina carrier, the metal oxide being present in an excess of about 15% by weight of the metal oxide required to furnish the oxygen necessary for oxidative dehydrogenation of a propionitrile, the metal oxide oxygen donor being selected from the group consisting of stannic oxide, lead oxide, zinc oxide and antimony oxide.

4,178,306

PREPARATION OF N-(PHOSPHONOACETYL)-L-ASPARTIC ACID

Jack L. Parsons, 800 Maple Rd., East Aurora, N.Y. 14050

Filed Aug. 10, 1978, Ser. No. 932,487

Int. Cl.[2] C07F *9/38*

U.S. Cl. 260—502.5 3 Claims

1. In a method for the preparation of a sodium salt of N-(phosphonoacetyl)-L-aspartic acid, the improvement which comprises reacting L-aspartic acid, dibenzyl ester p-toluenesulfonate with triethylamine, followed by the addition of phosphonoacetyl chloride to produce the N-(phosphonoacetyl)-L-aspartic acid moiety in the form of the dibenzyl ester, wherein the carboxyl groups of the N-(phosphonoacetyl)-L-aspartic acid are esterified, and adding cyclohexylamine under anhydrous conditions to produce the cyclohexylamine salt of said dibenzyl ester, and hydrolyzing the cyclohexylamine salt to produce a sodium salt of N-(phosphonoacetyl)-L-aspartic acid.

4,178,307

PROCESS FOR PREPARING SULPHONIC ACIDS AND SULPHONATES

Aristide Boy; Henri Galy, both of Pau; Raoul Ivaldi, Orthez, and Hubert Passedroit, Gan, all of France, assignors to Ato Chimie, Paris, France

Continuation-in-part of Ser. No. 732,120, Oct. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 645,092, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 507,246, Sep. 18, 1974, abandoned, which is a continuation of Ser. No. 169,145, Aug. 4, 1971, abandoned. This application Apr. 12, 1978, Ser. No. 895,549

Claims priority, application France, Aug. 7, 1970, 70.29211

Int. Cl.[2] C07B *13/00;* C07C *143/02*

U.S. Cl. 260—504 S 10 Claims

1. A process for separating the sulphonic acids in an untreated paraffin sulphonic solution containing in addition to said paraffin sulphonic acids, sulphuric acid, water, and non-sulphonated paraffins, which comprises:

(a) admixing with the paraffin sulphonic acid solution, at least one slightly polar solvent selected from the group consisting of alkanones, cycloalkanones, aliphatic ethers, cycloaliphatic ethers, alkyl alkanoates, cycloalkylalkanoates, alkylcycloalkanoates and aliphatic ketoesters containing at least 5 carbon atoms, having a solubility in water less than 7% by weight, which forms an azeotrope with water, thereby forming a mixture having an organic phase containing paraffin sulphonic acids dissolved therein and an aqueous phase containing the sulphuric acid;

(b) separating said organic phase from said aqueous phase;

(c) neutralizing said separated organic phase by admixture with a composition selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth metal oxides, alkaline earth metal hydroxides, and alkaline earth metal carbonates thereby converting the sulphonic acids present in said organic phase into sulphonates, and forming a neutralized organic phase wherein the ratio of the amount of water to the amount of slightly polar solvent in said neutralized phase is at most equal to the corresponding ratio for the azeotrope which forms between water and the slightly polar solvent; and

(d) removing the volatile components from the neutralized organic phase to recover the sulphonates under temperature and pressure conditions whereby said sulphonates are in a molten state.

4,178,308

PROCESS FOR THE PREPARATION OF 1-AMINO-8-NAPHTHOL-3,6-DISULPHONIC ACID (H-ACID)

Willi Schössler, Cologne; Horst Behre, Odenthal, and Rolf Pütter, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 920,033

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732291

Int. Cl.[2] C07C *143/66*

U.S. Cl. 260—509 11 Claims

1. A process for the preparation of a mono-alkali metal salt of 1-amino-8-naphthol-3,6disulphonic acid which comprises reacting 1-naphthylamine-3,6,8-trisulphonic acid and/or a salt thereof and/or a naphthylamine-trisulphonic acid isomer mixture and/or salt thereof with an aqueous alkali metal hydroxide solution at elevated pressure and elevated temperature and in the presence of an aliphatic alcohol having 1 to 6 carbon atoms or alcoholate thereof, and separating out the mono-alkali metal salt by acidification.

4,178,309

MANUFACTURE OF SYMMETRICAL DIALKYLUREAS

Dietrich Luetzow, Limburgerhof; Norbert Neth, Bobenheim-Roxheim; Ulrich Wagner, Limburgerhof, and Klaus Volkamer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,160

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735265

Int. Cl.[2] C07C *127/15*

U.S. Cl. 260—553 R 1 Claim

1. A process for the manufacture of a symmetrical dialkylurea by reacting a monoalkylamine with CO_2 at an elevated temperature and under superatmospheric pressure, in which the unconverted starting

materials, water and the by-products formed in the reaction zone, as well as alkylamine alkylcarbamate, after thermal decomposition into monoalkylamine, CO_2 and water, are separated from the dialkylurea formed, and thereafter a part of the unconverted starting materials

plus reaction by-products, with or without water, may or may not be recycled to the reaction zone, before isolating an aqueous solution, containing a monoalkylamine, CO_2 and other reaction by-products, which solution is treated with alkali metal hydroxide solution in a column, the monoalkylamine, after separation from CO_2 and water, being recycled to the reaction zone, in which process the aqueous solution, before treatment with alkali metal hydroxide solution, is stripped, in a subsidiary column, with an inert gas to which CO_2 or monoalkylamine may or may not be admixed, and at least a part of the reaction by-products formed is taken off at the top of the column, the liquid discharged from the bottom of the subsidiary column is fed, via a collecting vessel, to the alkali treatment column, and the stream of gas issuing at the top of the

treatment column is compressed without further purification and is liquefied by cooling.

4,178,310

CATALYST FOR HYDRATION OF NITRILES

John A. Fetchin, Stamford, and Kin H. Tsu, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 558,998, Mar. 17, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,724

Int. Cl.[2] C07C *102/08*

U.S. Cl. 260—561 N **4 Claims**

1. In a process for catalytic hydration of acrylonitrile to produce acrylamide by flowing a reactant solution comprising acrylonitrile in water through a fixed bed of copper-magnesium silicate type catalyst after reduction of the catalyst, the improvement wherein said catalyst has been treated prior to the hydration reaction by calcining the catalyst in a non-reactive atmosphere at calcining temperature in the range from 300° to 500° C. for time sufficient to substantially decrease the rate of decay of catalytic activity during use of the reduced catalyst in the defined hydration process.

4,178,311

PROCESS FOR THE PRODUCTION OF COMPOUNDS USEFUL IN PERFUMERY

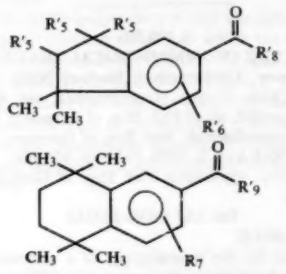
Mark A. Sprecker, Sea Bright, and Ernst T. Theimer, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 897,903, Apr. 19, 1978. This application Oct. 27, 1978, Ser. No. 955,330

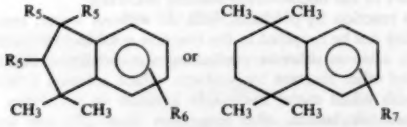
Int. Cl.[2] C07C *45/14*

U.S. Cl. 260—592 **4 Claims**

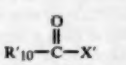
1. A process for preparing acyl benzene derivatives having the structures:



wherein R'_5 is hydrogen or methyl; R_6 and R'_7 are the same or different hydrogen or C_1–C_3 lower alkyl; R'_8 and R'_9 are C_1 to C_3 are the same or different lower alkyl comprising the steps of reacting an indane derivative or a tetrahydronaphthalene derivative having one of the structures:



with an acyl halide having the structure:



wherein R'_{10} is C_1–C_3 lower alkyl and X' is chloride, bromide or iodide, in the presence of a solvent selected from the group consisting of 2,2,4-trimethyl pentane, n-hexane, and n-octane at a temperature of between −20° C. and −5° C. in the presence of an aluminum chloride catalyst; the mole ratio of solvent to the indane or tetrahydronaphthalene derivative being from 1:10 up to 10:1; the mole ratio of aluminum chloride to acyl halide being from 1:2 up to 2:1; the mole ratio of indane or tetrahydronaphthalene derivative to acyl halide being from 1:1 up to 10:1.

4,178,312

IRIDIUM OR RHODIUM CATALYSTS FOR HYDROFORMYLATION AND ISOMERIZATION OF OLEFINS

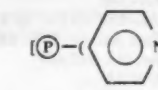
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,603

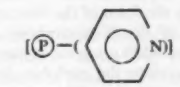
Int. Cl.[2] C07C *45/08*

U.S. Cl. 260—604 HF **7 Claims**

1. A method for converting olefins to aldehydes comprising converting said olefins in the presence of a catalyst of the formula



said conversions carried out at temperatures of from about 60° C. to about 150° C. and hydrogen carbon monoxide pressures of from about 300 to about 3500 psig, wherein



is a heterocyclic nitrogen-containing polymer is selected from the group consisting of 4-vinylpyridine/divinylbenzene, 3-vinylpyridine/divinylbenzene, 2-vinylpyridine/divinylbenzene, polyphenylquinoxaline/divinylbenzene, and poly[N-vinylcarbazole]/divinylbenzene with available pyridine linkages, M is rhodium or iridium, and X is selected from the group consisting of boron, chlorine, iodine, or fluorine and n is 1 or 2.

4,178,313

OLEFIN ISOMERIZATION AND HYDROFORMYLATION PROCESS

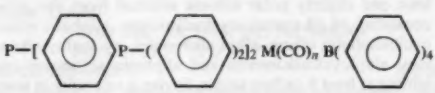
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,601

Int. Cl.[2] C07C *45/08*

U.S. Cl. 260—604 HF **5 Claims**

1. A method for converting olefins to aldehydes wherein said olefins are converted to aldehydes in the presence of a catalyst having the general structure



said conversions carried out at temperatures of from about 60° to about 150° C. and hydrogen/carbon monoxide pressures of from about 50 to about 300 psig wherein Ⓟ is a diphenylphosphinated cross-linked polystyrene, M is rhodium or iridium, and n is 1 to 3.

4,178,314

IRIDIUM OR RHODIUM TRIHALIDE POLYMER BOUND HYDROGENATION AND HYDROFORMYLATION CATALYST

John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,596

Int. Cl.[2] C07C *45/08*

U.S. Cl. 260—604 HF 7 Claims

1. An improved method for converting olefins to aldehydes in the presence of a catalyst at temperatures of from about 60° C. to about 150° C. and pressures of from about 300 to about 3500 psig in the presence of hydrogen and carbon monoxide, the improvement comprising converting said olefins in the presence of a catalyst of the generic formula Ⓟ—MX_3, wherein M is rhodium or iridium, X is selected from the group consisting of fluorine, chlorine, bromine, and iodine and Ⓟ is a polyvinyl pyridine/divinylbenzene copolymer.

4,178,315

PROCESS FOR THE PREPARATION OF NITROSOBENZENE

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 24, 1978, Ser. No. 889,810

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713602

Int. Cl.[2] C07C *76/00*

U.S. Cl. 260—647 10 Claims

1. An improved process for the preparation of nitrosobenzene by the catalytic reduction of nitrobenzene wherein the improvement comprises utilizing as a reducing agent a compound selected from the group consisting of aliphatic compounds containing from about one to about twenty carbon atoms, cycloaliphatic compounds containing from about four to about twelve carbon atoms, benzene, naphthalene, and ethylenically unsaturated compounds containing from about two to about 10 carbon atoms.

4,178,316

METHOD OF PREPARING 1,1-DIFLUOROETHYLENE FROM ACETYLENE

Neithart Schultz; Peter Martens, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 800,605, May 25, 1977. This application Dec. 1, 1977, Ser. No. 856,567

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659712

Int. Cl.[2] C07C *17/34*

U.S. Cl. 260—653.5 5 Claims

1. In a process for preparing 1,1-difluoroethylene by subjecting 1,1-difluoroethane to photochlorination at 20° to 150° C. to form 1,1-difluoro-1-chloroethane and effecting pyrolysis thereof without isolation of said 1,1-difluoro-1-chloroethane, the improvement which comprises employing as the difluoroethane charge an acetylene containing unrefined reaction product obtained by the catalytic hydrofluorination of acetylene employing an acetylene:HF mol ratio of 1:2.0–2.1 at a temperature up to 350° C. and a contact time of 5–30 seconds, said unrefined reaction product containing up to 3 volume percent acetylene and a maximum of 8 volume percent vinyl fluoride.

4,178,317

MANUFACTURE OF OLEFINICALLY UNSATURATED ALIPHATIC OR CYCLOALIPHATIC HYDROCARBONS

Peter Horn, Hirschberg; Otto-Alfred Grosskinsky, and Hugo Fuchs, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,678

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726106

Int. Cl.[2] C07C *3/00*

U.S. Cl. 585—357 9 Claims

1. A process for the manufacture of olefinically unsaturated aliphatic or cycloaliphatic hydrocarbons which comprises:

contacting at least one member of the group consisting of (a) alkanecarboxylic acids of 3 to 20 carbon atoms, (b) 5-membered or 6-membered cycloalkanecarboxylic acids and (c) alkyl, cycloalkyl, aralkyl or phenyl esters of (a) or (b),

in the gas phase,

at a temperature of from about 250° to 800° C.,

with a catalyst in which the active material is a combination of a compound selected from the group consisting of boron trioxide, boric acid and boron nitride and a compound selected from the group consisting of aluminum oxide, silicon dioxide, titanium dioxide and zirconium dioxide.

4,178,318

GRAFT POLYBUTADIENE COPOLYMERS

Mo-Fung Cheung, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1978, Ser. No. 900,381

Int. Cl.[2] C08F *271/00;* C08L *51/00;* C09D *3/727*

U.S. Cl. 525—77 18 Claims

1. An alkaline resistant primer composition comprising a graft copolymer that has a self-crosslinking portion that is about 10–60% by weight of the graft copolymer, the graft copolymer made by reacting in the presence of polymerization catalyst and under non-aqueous conditions:

(A) aliphatic conjugated diolefin polymer having a number average molecular weight between about 1000–20,000 wherein about 40–90% of the aliphatic diolefin units are in 1,2 vinyl configuration;

(B) olefinically unsaturated grafting monomers, copolymerizable with one another, comprising (i) about 10–40 mole percent of acrylamide monomers corresponding to the formula

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CON-CH_2-O-\underset{\displaystyle R_1}{\underset{|}{R_2}}$$

wherein R is a hydrogen or methyl, R_1 is hydrogen or C_1–C_{18} alkyl, R_2 is hydrogen or C_1–C_8 alkyl; (ii) about 5–40 mole percent of hydroxy functional monomers, (iii) about 0–25 mole percent of carboxy functional acrylic monomers and (iv) at least about 3 mole percent of one or more esters of acrylic or methacrylic acid and C_1–C_8 aliphatic alcohols, wherein there are above about 0.1 hydroxy groups in the graft copolymer for each amide group of (i).

4,178,319

HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXYPHOSPHATE CATALYST-A

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,331

Int. Cl.[2] C08L *63/00*

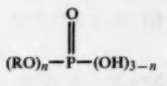
U.S. Cl. 525—188 12 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclu-

sive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a polyepoxide resin having a number average molecular weight (M_n) of between about 140 and about 3,000;

(B) a reactive catalyst comprising at least one oligomeric hydroxy functional organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from the group consisting of mono or dihydroxy radicals containing one or more ester linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6000, said oligomeric organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of epoxy functionality on said polyepoxide resin, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said oligomeric organophosphate ester, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said epoxy functionality of said polyepoxide resin during cure of said coating composition.

4,178,320

HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXYPHOSPHATE CATALYST-C

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,322

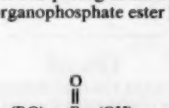
Int. Cl.[2] C08L *63/00*

U.S. Cl. 525—188 **16 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight ($\overline{M}_n$) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising at least one oligomeric hydroxy functional organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from the group consisting of mono- or dihydroxy radicals containing one or more ester linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight ($\overline{M}_n$) of between 150 and about 6000,

said oligomeric hydroxy functional organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said oligomeric hydroxy functional organophosphate ester, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said pendent epoxy functionality of said copolymer during cure of said coating composition.

4,178,321

HIGH SOLIDS COMPOSITION WITH HYDROXY FUNCTIONAL ACRYLIC ORGANOPHOSPHATE REACTIVE CATALYST - I

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,326

Int. Cl.[2] C08L *63/00*

U.S. Cl. 525—188 **11 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvoltile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight ($\overline{M}_n$) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight ($\overline{M}n$) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendent hydroxy groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight ($\overline{M}_n$) of between 150 and about 6000,

said hydroxy functional acrylic organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said pendent epoxy functionality of said copolymer during cure of said coating composition.

4,178,322

HIGH SOLIDS COATING COMPOSITION WITH ACRYLIC HYDROXYPHOSPHATE CATALYST-III

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,329
Int. Cl.[2] C08L 63/00
U.S. Cl. 525—188 8 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a polyepoxide resin having a number average molecular weight ($\overline{M}_n$) of between about 140 and about 3,000;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight ($\overline{M}n$) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendant hydroxy groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight ($\overline{M}_n$) of between about 150 and about 6000, said hydroxy functional acrylic organophosphate reactive catalyst being included in said composition in an amount sufficient to provide between about 0.9 and about 1.5 equivalents of acid functionality for each equivalent of epoxy functionality on said polyepoxide resin, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in ssaid composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said epoxy functionality of said polyepoxide resin during cure of said coating composition.

4,178,323

HIGH SOLIDS COATING COMPOSITION WITH HYDROXY FUNCTIONAL ACRYLIC ORGANOPHOSPHATE REACTIVE CATALYST-II

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,330
Int. Cl.[2] C08L 63/00
U.S. Cl. 525—188 12 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendant epoxy functionality, having a number average molecular weight ($\overline{M}n$) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomer bearing hydroxy functionality, with the total of said glycidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight ($\overline{M}n$) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendent hydroxyl groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight ($\overline{M}n$) of between about 150 and about 6000, said hydroxy functional acrylic organophosphate reactive catalyst being included in said composition in an amount sufficient to provide between about 0.9 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said bifunctional copolymer, (iii) a hydroxyl group on said hydroxy functional additive, or (iv) as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,178,324

HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXY PHOSPHATE CATALYST-B

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,321
Int. Cl.[2] C08L 63/00
U.S. Cl. 525—188 17 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendant epoxy functionality, having a number average molecular weight ($\overline{M}n$) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomer bearing hydroxy functionality, with the total of said glycidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising hydroxy functional organo-phosphate ester having the formula:

$$(R{-}O)_n{-}\overset{\overset{O}{\|}}{P}{-}(OH)_{3-n}$$

wherein n=1 to 2 and R is selected from the group consisting of mono or dihydroxy radicals containing one or more ester

linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000, said organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said organophosphate ester, (ii) a hydroxyl group on said bifunctional copolymer, (iii) a hydroxyl group on said hydroxy functional additive, or (iv) as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,178,325

HIGH SOLIDS COATING COMPOSITIONS CONTAINING LIQUID BISHYDROXY ETHYL ETHER OF A BISPHENOL

Kazys Sekmakas, Palatine, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 3, 1978, Ser. No. 866,256

Int. Cl.[2] C08L *61/26, 61/20*

U.S. Cl. 525—157 **9 Claims**

1. A fluid resinous coating composition containing less than about 30% of volatile organic solvent and which cures on baking, said coating composition consisting essentially of a mixture of:

(1) a copolymer of monoethylenic monomers including from about 5–20% of monoethylenic monomer having a functional group reactive with the N-methylol group and selected from carboxylic acid, hydroxy, and amide groups, said copolymer being produced by copolymerization in an organic solvent solution containing a major proportion of component (2) below:

(2) liquid bishydroxy ethyl ether of a bisphenol formed by reacting ethylene oxide with a bisphenol alone or in admixture with liquid bishydroxy propyl ether of a bisphenol formed by reacting propylene oxide with a bisphenol; and

(3) an aminoplast resin; said copolymer constituting from about 4.5% to 35% of the mixture, the bishydroxy propyl ether constituting from about 20% to 40% of the mixture, and the balance of the mixture of the three components consisting essentially of aminoplast resin, there being at least about 0.8 parts of aminoplast resin per part of copolymer, and said copolymer being present in an amount of from about 15–80% of the weight of the bishydroxy propyl ether.

4,178,326

LOW-SHRINK THERMOSETTING POLYESTERS

Donald R. Stevenson, Dover, and David A. Schmidt, Lorain, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 14, 1977, Ser. No. 851,085

Int. Cl.[2] C08L *67/06, 75/06*

U.S. Cl. 525—176 **12 Claims**

1. A low-shrink polyester molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, and thermosetting to form low-profile molded structures, wherein the resin composition comprises by weight at least about 25% ethylenically unsaturated thermosetting polyester polymer, about 5% to 20% of an acid functional thermoplastic polymer, and about 40% to 60% of an ethylenically unsaturated monomer copolymerizable with said thermosetting polyester polymer, the improvement comprising:

said thermoplastic polymer comprising a polymer mixture of vinyl copolymer dispersed in a polymeric diluent wherein the mixture contains by weight between about 60% and 90% vinyl copolymer, said polymeric diluent having number average molecular weight of between about 500 and 5,000 and said polymeric diluent is a linear saturated polyester or polyalkylene oxide.

4,178,327

AR-HALO-AR(T-ALKYL)STYRENES AND POLYMERS THEREOF

Richard H. Hall, Midland; Daniel H. Haigh, Sanford; Junior J. Lamson, Bay City, and Larry D. Yats, Clare, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 696,599, Jun. 16, 1976, Pat. No. 4,054,733, which is a continuation-in-part of Ser. No. 534,391, Dec. 19, 1974, abandoned, which is a division of Ser. No. 94,578, Dec. 2, 1970, abandoned. This application Aug. 5, 1977, Ser. No. 822,129

Int. Cl.[2] C08F *4/32, 267/06, 12/16*

U.S. Cl. 525—169 **9 Claims**

1. An ar-halo-ar-(t-alkyl)styrene wherein halo is chloro, bromo or fluoro and tertiary alkyl has from 4 to 8 carbon atoms and is in a ring position para or meta to the ethylenically unsaturated group of the ar-halo-ar-(t-alkyl)styrene.

8. A curable composition comprising from about 10 to about 70 weight percent of an unsaturated polyester, from about 90 to about 30 weight percent of the polymerizable ar-halo-ar-(t-alkyl)styrene of claim 1 and a catalytic amount of a free-radical generating catalyst; said percentages being based on the total weight of the polyester and the ar-halo-ar-(t-alkyl)styrene, said polyester being the condensation reaction product of an unsaturated polycarboxylic acid with a polyhydric alcohol.

4,178,328

RIGID, HIGH IMPACT POLYPROPYLENE COMPOSITIONS

Krishnan Thiruvillakkat, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,349

Int. Cl.[2] C08L *53/02*

U.S. Cl. 525—98 **4 Claims**

1. A polymeric blend composition comprising from 80 to 60 wt. percent of a polypropylene polymer, from 10 to 20 wt. percent of a hydrogenated block copolymer having the general configuration A-B-A wherein prior to hydrogenation the A's are polymeric blocks of vinylaromatic monomer units and B is an elastomeric polymer block of a conjugated diene monomer, said copolymer being hydrogenated to remove the ethylenic unsaturation, and from 10 to 20 wt. percent polyethylene.

4,178,329

PLASTICS MATERIAL HAVING AN IMPROVED BLOOD TOLERANCE

Udo Becker, Marburg an der Lahn; Karlheinz Burg, Wiesbaden; Johann P. Fischer, Königstein, and Norbert Heimburger, Marburg an der Lahn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

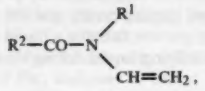
Filed May 5, 1978, Ser. No. 902,901

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751528

Int. Cl.[2] C08F *255/02*

U.S. Cl. 525—77 **7 Claims**

1. A plastics material, adaptable to biomedical uses, the surface of which material at least partially consists of a graft copolymer having a hydrocarbon main chain and side chains grafted thereon, said side chains being polymers comprising at least one vinyl monomer selected from the group consisting of vinylene carbonate and N-vinyl alkylamides of the formula



wherein R^1 and R^2 are the same or different and each is hydrogen or alkyl having 1 to 6 carbon atoms.

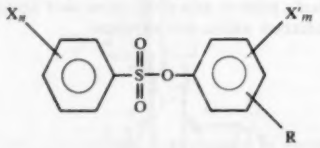
4,178,330

HALOARYL HALOBENZENESULFONATE FLAME RETARDANTS

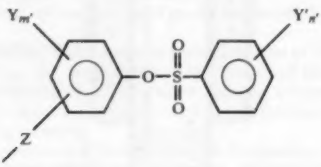
James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,581
Int. Cl.² C08K 5/42
U.S. Cl. 525—3 **16 Claims**

1. A flame retardant polyurethane composition comprising polyurethane and a flame retardant amount of haloaryl halobenzene sulfonate of the formula



wherein X and X′ are each independently selected halogen; n in an integer from 1 to 5 and m is an integer from 1 to 4, provided that the sum of m plus n is an integer from 4 to 9; and R is selected from the group consisting of hydrogen, halogen, and



wherein Y and Y′ are each independently selected halogen, M′ is an integer from 1 to 4 and n′ is an integer from 1 to 5, provided that the sum of m′ plus n′ is an integer from 4 to 9; and wherein Z is an alkylene or alkylidene group containing from 1 to about 6 carbon atoms.

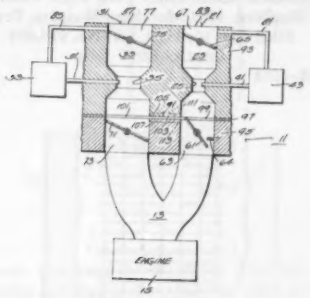
4,178,331

TWO STAGED CARBURETOR WITH ARRANGEMENT FOR REDUCING FUEL SPILLAGE

J. Bruce Emmons, Lindenhurst, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 29, 1977, Ser. No. 865,613
Int. Cl.² F02M 11/02
U.S. Cl. 261—23 A **17 Claims**

1. A carburetor comprising a first stage including a vertically extending primary air induction passage including a venturi section and a portion downstream of and below said venturi section, a primary fuel passage communicating with said venturi section of said primary air induction passage and with a fuel source, a primary throttle valve mounted in said downstream portion of said primary air induction passage for movement between a relatively closed position and a relatively open position, and means permitting air or fuel flow past said primary throttle valve when in said relatively closed position, and a second stage including a vertically extending secondary air induction passage including a venturi section and a portion downstream of and below said venturi section, a secondary fuel passage communicating with said venturi section of said secondary air induction passage and with a fuel source, and a secondary throttle valve mounted in said downstream portion of said secondary air induction passage for movement between



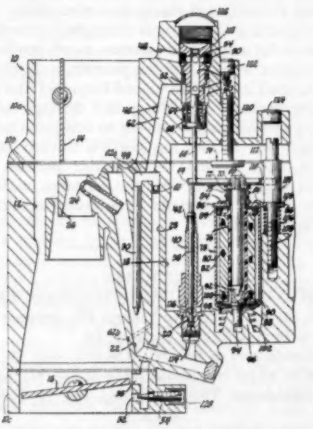
an open position and a closed position, and fuel or air passage means communicating soley between said primary and secondary air induction passages closely adjacent and above said secondary throttle valve for draining fuel accumulating in said secondary air induction passage above said secondary throttle valve to said primary air induction passage.

4,178,332

CARBURETOR AND METHOD OF CALIBRATION

Robert L. Hogeman, Rochester; Jack L. Seaman, and Roland S. Taylor, both of Fairport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 868,713, Jan. 11, 1978, abandoned. This application Jun. 19, 1978, Ser. No. 916,783
Int. Cl.² F02M 7/18
U.S. Cl. 261—50 R **5 Claims**



1. A carburetor comprising a fuel passage, a metering apparatus reciprocable between a rich position and a lean position, said apparatus including a bracket and a metering device biased against and operated by said bracket to restrict fuel flow through said passage in said lean position and to permit increased fuel flow through said passage in said rich position, said apparatus further including a solenoid armature carrying said bracket, a solenoid coil assembly surrounding said armature and energizable for moving said apparatus to one of said positions, and a spring biasing said apparatus to the other of said positions, and wherein the improvement comprises a mem-

ber included as a portion of said coil assembly and engaged by said armature in said one position, and an adjustable stop controlling the position of said coil assembly for establishing said one position.

4,178,333

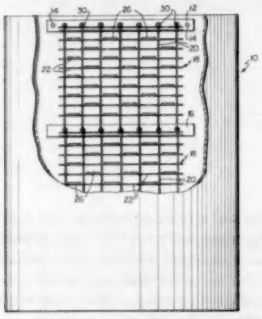
HANGER ASSEMBLY FOR FILL STRIPS

Charles E. Shepherd, 4202 Markham, Houston, Tex. 77027

Filed Jun. 15, 1978, Ser. No. 915,651

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—111 **5 Claims**



1. A hanger assembly adapted for use in cooling towers comprising:

(a) at least one header formed with a plurality of openings extending through said header in aligned and spaced relation to each other, and

(b) a mesh hanger assembly comprised of a first series of spaced members extending in one direction and a second series of spaced members extending in a direction generally perpendicular to said first series of members, said members thus forming a mesh having a plurality of openings adapted to receive fill slats, each of said members of said first series being formed with a clamp end at at least one end thereof, said clamp end comprising a first rigid load-supporting leg portion extending generally perpendicular to the axis of said member, a cam portion reversely bent relative to said first leg portion, a shoulder portion, and a second leg portion spaced from said first leg portion, the movement of said clamp end through an associated opening in said header serving to compress said cam portion and said second leg portion toward said first leg portion, after which the shoulder portion snaps into contact engagement with the adjacent surface of said header thereby to prevent withdrawal of said clamp end from said opening.

4,178,334

HIGH VOLUME HUMIDIFIER/NEBULIZER

Kenneth G. Miller, Elk Grove Village, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 826,119, Aug. 19, 1977, Pat. No. 4,110,419, which is a continuation of Ser. No. 569,490, Apr. 18, 1925, abandoned. This application Jan. 27, 1978, Ser. No. 872,875

The portion of the term of this patent subsequent to Jul. 11, 1993, has been disclaimed.

Int. Cl.[2] A61M *15/00*

U.S. Cl. 261—142 **8 Claims**

1. Cartridge type humidifying and nebulizing apparatus for humidifying a breathable gas such as oxygen-supplemented air or the like to be inhaled by a patient undergoing inhalation therapy, said apparatus comprising in combination:

(a) cartridge module means including a tubular main body portion of metal with an inner peripheral wall;

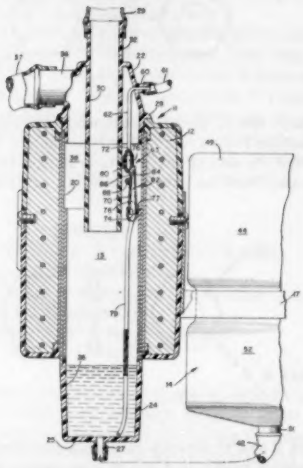
(b) said cartridge module means including an upper end portion means unitarily attached to said main body portion and a lower end portion means of a non-metallic material attached to said main body portion;

(c) said lower end portion means and the lower end part of said main body portion defining a liquid holding means for retaining humidifying liquid during operative use of said apparatus;

(d) said cartridge module means further comprising liquid absorption means including an open center generally tubular liquid-absorption column member with an inner peripheral face constituting an evaporating surface for humidifying liquid, disposed generally contiguously within coextensive with a substantial part of said main body portion and lower end portion means, said absorption column having a lower end part adapted to be wetted directly by the humidifying liquid when in said liquid holding means, and to convey by absorption liquid upwardly adjacent said evaporating surface;

(e) said upper end portion means and upper part of the main body defining an air space above the humidifying liquid level of said liquid holding means of paragraph (c);

(f) said upper end portion means unitarily including a gas inlet feed pipe for directing gas to be humidified into said main body portion, at a point above said liquid level, for humidifcation within said air space;



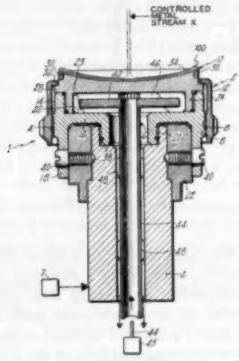
(g) said air space having a venturi means including an elongated body with longitudinally disposed upper and lower hollow stem portions that are axially offset and constitute gas and liquid inlet passage means, respectively, said upper hollow stem portion having means whereby it may be connected to a source of pressurized gas; said lower hollow stem portion having at the other end a tube extending downwardly into said liquid, said gas passage means terminating in transversely adjacent orifices whereby a flow of pressurized gas out of the gas passage orifice is directed past the orifice of said liquid passage creates a suction in the latter to draw liquid up said tube into the lower hollow stem and through the orifice to entrain liquid from the liquid passage orifice and to atomize said liquid into said air space;

(h) said upper end portion means further including a separate projecting humidified-gas-outlet delivery pipe disposed a substantial distance above said liquid level and in direct fluid communication with said air space, said delivery pipe adapted to be connected to an output delivery tube leading to said patient, whereby said gas in said module and delivery tube is maintained in a substantially fully vapor-saturated condition.

4,178,335
METHOD OF PRODUCING SOLID PARTICLES OF METAL

Robert A. Metcalfe, West Palm Beach, and Romeo G. Bourdeau, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,898
Int. Cl.[2] B01J *2/02*
U.S. Cl. 264—8 **5 Claims**



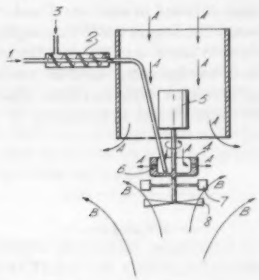
1. A method of producing solid particles of metal comprising:
(1) melting metal to provide a source of molten metal;
(2) forming a metal disc having an upper surface with a ring of metal positioned around the metal disc at the top thereof, said ring of metal being formed of a metal which can be welded to the metal being melted,
(3) spinning said disc at a desired rate;
(4) pouring said molten metal on the surface of the spinning disc;
(5) controlling the temperature and flow rate of the molten metal and the temperature of the surface of the spinning disc to form a solidified skull of a desired thickness on the surface of the spinning disc with the skull being welded to the ring of metal;
(6) continue pouring molten metal on the spinning surface of the desired solidified skull formed whereby the molten metal is atomized in being thrown radially outward therefrom to form solid particles of a desired size.

4,178,336
PRODUCTION OF FIBRES

Paul Snowden, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,344
Claims priority, application United Kingdom, Mar. 11, 1977, 10405/77
Int. Cl.[2] B22D *23/08*
U.S. Cl. 264—8 **10 Claims**

1. A process for centrifugally spinning formaldehyde fibres from a liquid formaldehyde resin which comprises the steps of feeding the resin and a resin-curing catalyst, which at temperatures above 100° C. will cure and chemically stabilize the resin and render it insoluble in cold water, into a rotating spinning cup, directing downwardly towards the cup a flow of cold, humid air, at least part of which flow enters the cup with the resin/catalyst mixture, the temperature and humidity of the air being such that it inhibits drying and reaction of the resin/-catalyst mixture whilst in the cup, the rotation of the cup causing the resin/catalyst mixture to flow as an even film over the inner surface of the cup, in the presence of the cold, humid air, and to be spun centrifugally from the outer wall of the cup, in the form of individual, separate fibres which attenuate until they have achieved the desired diameter, providing from below the cup outwardly-directed currents of hot dry air at a temperature such as to heat the fibres to between 50° C. and 100° C. to dry the attenuated fibres and transport them to a

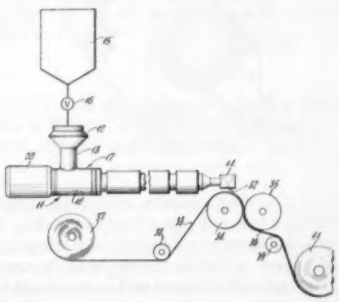


collecting zone, removing the dry fibres from the collecting zone, and curing and chemically stabilizing them by heating at above 100° C. until they are insoluble in cold water.

4,178,337
THERMOPLASTIC ELASTOMERIC FILM EXTRUSION PROCESS

Joseph J. Hall; Ralf Korpman, both of Bridgewater, and Stephen M. Sinker, Middlesex, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 18, 1977, Ser. No. 843,110
Int. Cl.[2] B29D *7/02*; B29B *3/00*
U.S. Cl. 264—28 **5 Claims**



1. The process of extruding a thermoplastic elastomeric layer from a mixture of dry particles using a single screw extruder having a helical extruder screw rotating within an extruder barrel having a feed section, which comprises: feeding a mixture of dry particles into an inlet portion of said feed section and into rotative and axial driving contact with said screw, said mixture consisting predominantly of dry thermoplastic elastomer particles and about 20–300 parts per 100 parts by weight of the total elastomer particles of dry resin particles, said elastomer particles having a relatively high molecular weight, said molecular weight being a number average molecular weight of at least about 75,000, and said resin particles having a relatively low molecular weight, said molecular weight being a number average molecular weight of not above about 3,000:
(a) precooling at least the resin component of said mixture to provide a temperature of said mixture of about 0°,
(b) driving the cooled mixture axially forward with said screw and
(c) maintaining the temperatures of the particles below that which would cause the mixture to agglomerate and stick to the screw until the axial driving forces on the mixture have increased to the extent they will overcome any

tendency of the mixture to stick to the screw, said temperatures being achieved by cooling the barrel adjacent the inlet section sufficiently so that its outer surface is maintained at temperatures below about 5° C;

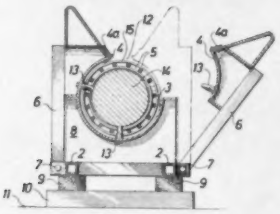
feeding said mixture forward in said barrel under substantially steady-state pressure conditions while thoroughly mixing and melting the mixture to cause it to become homogeneous; and passing the melted homogeneous mixture through an elongated extrusion die to form a thermoplastic elastomeric sheet or film not above about 50 mils in thickness.

4,178,338

METHOD OF CASTING THIN-WALLED, HOLLOW CONCRETE POSTS

Per-Erik Bondpers, and Göte Liljegren, both of Växjö, Sweden, assignors to A-Betong AB, Växjö, Sweden

Filed Feb. 7, 1978, Ser. No. 875,724
Claims priority, application Sweden, Feb. 7, 1977, 7701342
Int. Cl.² B28B *1/08*
U.S. Cl. 264—42 **4 Claims**



1. A method of casting a hollow, reinforced, tapering concrete post having a thin wall and a length exceeding 10 m in a hoirzontal mould, a tapering reinforcing cage being disposed in the mould and a core of steel or the like being disposed within the reinforcing cage and centered within the mould by a plurality of support posts extending radially inwardly from the sides of the mould to thereby define an annular mould chamber having an elongated filling slot running along the upper side thereof, comprising the steps of:

(a) charging a readily pourable concrete mass into the annular mould chamber through the filling slot, said concrete mass comprising 16 to 20% by weight of cement, 4 to 8% by weight of water, a sufficient amount of flow-promoting agent to provide a slump measurement of between 12 and 14 cm, and an aggregate having a maximum size of 8 mm including 40 to 50% of said aggregate being gravel having a maximum size of 4 mm,

(b) vibrating the mould for 10 to 25 minutes without rotating it to settle the concrete mass and evenly fill the annular mould chamber,

(c) simultaneously and thereafter heating the concrete mass to accelerate its hardening,

(d) allowing the mould to remain stationary for 15 to 30 minutes,

(e) revibrating the mould for 2 to 3 minutes,

(f) withdrawing the core from the post 1.5 to 4 hours after the charging of the concrete mass and before it has completely hardened, and

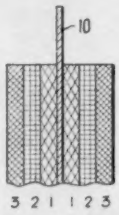
(g) removing the finished post from the mould.

4,178,339

LAMINATED ELECTRODE

Peter J. Powell, and Gerard D. Nagy, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence

Filed Oct. 25, 1977, Ser. No. 845,393
Claims priority, application Canada, Nov. 17, 1976, 265944
Int. Cl.² C04B *35/64*
U.S. Cl. 264—61 **20 Claims**



1. A method for the manufacture of a silver/silver chloride electrode, said electrode comprising a plurality of layers of a porous material comprising an evenly dispersed matrix of metallic silver bonded to silver chloride particles, on both major surfaces of a metal grid, said method comprising:

(a) preparing a homogeneous mixture, in the form of a finely divided powder, of a major amount of silver chloride and a minor amount of a silver compound reducible to metallic silver at a temperature below the melting point of silver chloride, which silver compound is selected from the group consisting of silver oxides, silver carbonate, disilver fluoride, silver sulfide and mixtures thereof,

(b) individually compressing a plurality of layers of said mixture, one on top of another onto a metal grid at pressures of about 800 to about 1500 psi,

(c) subjecting the assembly so formed to a final pressing step at pressures of about 3,000 to about 5,000 psi, and

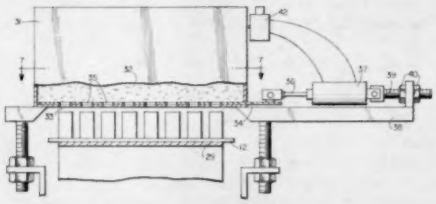
(d) sintering, at a temperature below the melting point of silver chloride, for a time sufficient to reduce the silver compound to metallic silver.

4,178,340

METHOD AND APPARATUS FOR MAKING CONCRETE BRICK HAVING ANTIQUE APPEARANCE

Niilo M. Hyytinen, Reno, Nev., assignor to A B C Concrete Products, Reno, Nev.

Filed Jun. 26, 1978, Ser. No. 919,529
Int. Cl.² B28B *1/29*
U.S. Cl. 264—73 **2 Claims**



1. The method of making a brick having a different antique appearance on opposite sides only comprising the steps of spreading a first quantity of dry coloring material on a generally flat surface, molding at least one brick of liquefied hardenable material on said surface, said brick having a first side engaging said first quantity of coloring material so that the liquid in said hardenable material saturates said dry coloring material and imparts a mottled effect to said one side of said brick, placing a second quantity of coloring material on a

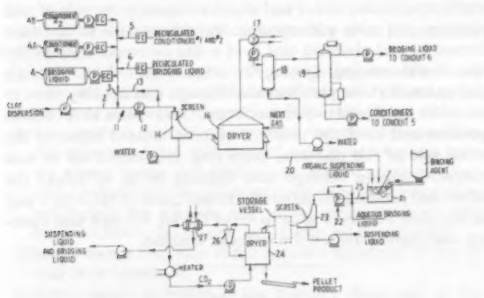
second side of said brick which is remote from said first quantity of coloring material, spreading said second quantity of coloring material along said second side of said brick to impart a streaked effect thereto, spraying a liquid on said second quantity of coloring material to saturate the same, and curing said brick, whereby said coloring material on one side of said brick has a first appearance and the coloring material on the opposite side has a different appearance.

2. The method of making bricks having an antique appearance comprising the steps of intermittently moving a substantially flat pallet along a predetermined path. automatically spreading a first quantity of dry flowable coloring material on the upper surface of said pallet while said pallet is moving, interrupting the movement of said pallet, molding a plurality of concrete bricks on said coloring material carried by said pallet while the pallet is not moving so that the liquid in the concrete saturates the dry coloring material and imparts a mottled effect to one side of each of said bricks, moving said pallet and said bricks along said path, automatically placing a second quantity of dry flowable coloring material onto a second side of said bricks remote from said first quantity of coloring material, spreading said second quantity of coloring material on said bricks to impart a streaked effect to said second side of said bricks, spraying a liquid on said second coloring material to saturate the same, and curing said bricks, whereby substantially two opposite sides only of said bricks have coloring material thereon.

4,178,341
PROCESS FOR PREPARING AGGLOMERATES OF CLAYS

Bruce F. Caswell, Whitmore Lake, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

Filed Apr. 12, 1978, Ser. No. 895,788
Int. Cl.² B01J *2/06*
U.S. Cl. 264—117 **8 Claims**



1. A process for dewatering an aqueous clay dispersion and forming pellets of the clay particles, which comprises the steps of:

(a) adding to the aqueous clay dispersion (i) hydrophobic organic bridging liquid which is immiscible with water and (ii) liquid conditioner which is effective to displace water from the clay particles and to render the surfaces of the clay particles oleophilic, whereby to form a two-phase liquid system wherein the clay particles are dispersed in and wetted by said hydrophobic organic bridging liquid as one liquid phase and the other liquid phase is water which is essentially free of clay particles;

(b) agitating the two-phase liquid system to effect repeated collisions of the clay particles and thereby forming in said system a slurry of agglomerates in the water phase wherein said agglomerates consist essentially of the clay particles having said liquid conditioner adsorbed thereon and bound together by said hydrophobic organic bridging liquid;

(c) discontinuing said agitating and separating said agglomerates from the water;

(d) then drying said agglomerates to remove essentially all of said bridging liquid and said liquid conditioner therefrom;

(e) then dispersing said dried agglomerates and a binding agent for said agglomerates in hydrophobic organic suspending liquid to form a suspension;

(f) adding an aqueous bridging liquid to said suspension and agitating same to effect repeated collisons of said agglomerates whereby to form a dispersion of pellets in said hydrophobic organic suspending liquid wherein the pellets are coated with said aqueous bridging liquid and are impregnated and/or coated with said binding agent;

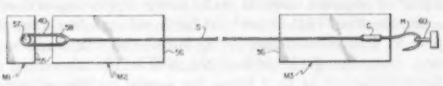
(g) then discontinuing said agitation and separating the pellets from said hydrophobic suspending liquid; and

(h) then recovering said pellets.

4,178,342
INJECTION MOLDING METHOD FOR THE MANUFACTURE OF A SNELLED FISHHOOK

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Continuation-in-part of Ser. No. 763,825, Jan. 31, 1977, abandoned, which is a continuation of Ser. No. 580,182, May 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,721, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 277,756, Aug. 3, 1972, Pat. No. 3,834,061, which is a continuation-in-part of Ser. No. 274,307, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 335,081, Feb. 23, 1973, Pat. No. 3,898,760, which is a continuation-in-part of Ser. No. 128,015, Mar. 25, 1971, Pat. No. 3,717,907. This application Feb. 10, 1978, Ser. No. 876,950
Int. Cl.² B29C *17/02, 6/04;* **B29D** *3/00*
U.S. Cl. 264—275 **2 Claims**



2. A method for the manufacture of a snelled fishhook from the injection molding of a thermoplastic, drawable, synthetic resin material, utilizing an injection mold of the type including elongated and separable superimposed mold halves having mating surfaces which incorporate registering and communicating cavities defining along its length a first slightly enlarged cylindrical end portion, an elongated narrow interconnecting passageway in the form of a strand, and an eyeloop passageway, with at least one of the mold halves being formed of at least two separable mold sections which effect a transverse split across said eyeloop passageway to define an end mold section and a remaining mold section, each said section being provided with stand rods which are raisable up from the surface of each mold section, said stand rods being disposed to either side of the transverse split within the embrace of the eyeloop passageway, said method comprising the steps of: inserting the shank of a fishhook into the enlarged cylindrical cavity of the superimposed mold halves; heating the resin to a moldable state; flowing the resin into the cavities of the mold halves about the shank of the fishhook, through the narrow interconnecting passageway to form an enlongated strand, and in the eyeloop passageway to form a loop strand; separating the mold halves after the mold has cooled so as to leave the snelled fishhook so formed in the half of the mold which is formed of the at least two sections; raising the stand rods in the mold sections from the surface of each section to be upstanding within the embrace of the loop strand; separating the end mold section and the remaining mold section of the mold half at the transverse split thereof and moving the sections longitudinally apart from each other such that the stand rods engage the loop at its apex and its crotch, respectively, and effect a drawing of the loop between its apex and crotch; effecting relative longitudinal movement between the fishhook and said mold section of said mold half so as to draw the snell strand between the en-

larged cylindrical portion and the apex of the loop; and ejecting the snelled fishhook so formed from the mold half.

4,178,343

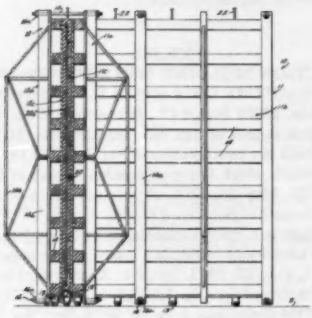
MANUFACTURE OF PRECAST CONCRETE UNITS AND A BUILDING CONSTRUCTED THEREWITH

Agustin Rojo, Jr., Paseo del Parque Z-12, Garden Hills, Bayamon, P.R. 00657

Division of Ser. No. 797,292, May 16, 1977, Pat. No. 4,127,971. This application Feb. 1, 1978, Ser. No. 874,057

Int. Cl.[2] B28B *7/22;* **E04G** *11/36*

U.S. Cl. 264—333 **5 Claims**



1. In a method for molding precast concrete building units, the steps of pouring the concrete into a mold cavity formed by a pair of opposite vertical walls and a supporting bottom, all separable from each other and mounted on wheels for transport on a horizontal supporting surface to effect said separation, maintaining the poured concrete in the assembled mold for a period of 2½ to 3 hours for partial curing of said unit, disassembling the mold cavity by separating the vertical walls from the supporting bottom by wheeling on said horizontal surface leaving the partially cured unit solely supported on said bottom, wheeling the bottom with the unit along said horizontal surface to clear the separated vertical walls, and maintaining the unit on said bottom until completely cured for vertical lifting therefrom while assembling the vertical walls with another supporting bottom into a mold cavity by wheeling the vertical walls and bottom into position on said horizontal surface and repeating the molding cycle therewith.

4,178,344

METHOD AND APPARATUS FOR REVERSING AND FLATTENING A DRIVER'S RESTRAINT CUSHION

Stanley E. Smith, Dayton; Richard W. Lyday, Vandalia, and Thomas R. Kushmaul, Springfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

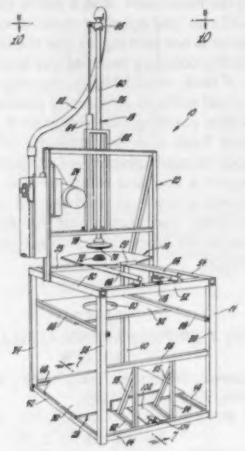
Filed Aug. 15, 1978, Ser. No. 933,711

Int. Cl.[2] B29C *17/06*

U.S. Cl. 264—572 **5 Claims**

1. Apparatus for reversing and flattening an occupant restraint cushion composed of a pair of overlapping sheets of flexible material secured along the outer edges thereof with one of said sheets having an opening located therein, said apparatus comprising a base supporting a loading platform having an aperture formed therein of a size generally corresponding to the size of said opening in said one of said sheets, a retaining member secured to said platform adjacent said aperture, said retaining member adapted to extend into said opening in said one of said sheets when the restraint cushion is positioned onto said loading platform and temporarily hold the latter mentioned sheet thereto, a ram supported by said base and adapted to engage the other of said sheets and force the latter through the opening in said one of said sheets and through the aperture in the loading platform and afterwards strip said one of said sheets from said retaining member so as to cause the inside and outside surfaces of said sheets to reverse, a source of pressurized air connected to said ram for supplying pressurized air to said restraint cushion so as to inflate the latter after said pair of sheets pass through said aperture, and means for compressing the inflated cushion into a pancake form.

4. A method for reversing an occupant restraint cushion and removing wrinkles therefrom wherein said restraint cushion is composed of a pair of overlapping sheets of flexible material sewn together along the outer edges thereof with one of the sheets having an opening located therein, said method comprising the steps of positioning the restraint cushion on a flat



platform with said one of said sheets contacting one side of said platform and with said opening registering with an aperture formed in said platform that is of a size corresponding to the size of said opening, forcing the other of said sheets through said aperture in the platform and through said opening so as to cause the inside and outside surfaces of said sheets to reverse in position and have the restraint cushion located adjacent the other side of the platform, supplying pressurized air to said restraint cushion through said opening so as to inflate the latter, and pressing the inflated restraint cushion between a pair of flat plate members so as to expel the air through said opening and thereby flatten the restraint cushion.

4,178,345

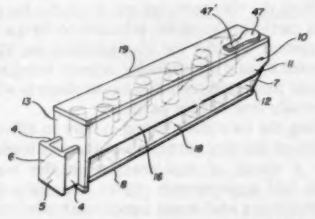
CUVETTE CARTRIDGE

Harold S. Terk, Richardson, Tex., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 8, 1978, Ser. No. 876,079

Int. Cl.[2] G01N *33/16, 21/24*

U.S. Cl. 422—61 **5 Claims**



1. A substantially rigid cuvette cartridge adapted for use

with chemical and microbiological analysis apparatus, said cartridge comprising the following elements:

a cartridge having a chamber with an opening for receiving fluid to be analyzed and a floor portion;

a plurality of cuvettes in fluid communication with said chamber and extending in a given direction from said floor portion;

a first fluid passage means extending in a direction opposite said given direction;

a second fluid passage means extending in said given direction said first and second fluid passage means resulting in said fluid communication between said chamber and cuvettes.

4,178,346

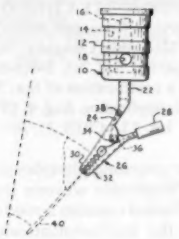
INCENSE BURNER DEVICE

Gerald L. Allen, 6765 Portage Ave., and Craig A. Chapman, 5417 Clem Rd., both of Portage, Ind. 46368

Filed Jun. 19, 1978, Ser. No. 916,968

Int. Cl.[2] A61L *9/02*

U.S. Cl. 422—126 **2 Claims**



1. A device for handling incense interior of an automobile, comprising:

a container having an open end, an opposing closed end and circumferentially spaced holes adjacent said closed end;

an exterior stem axially extending from said closed end;

lever members pivotally connected together intermediate the opposing distal ends thereof, said lever members having clamp means provided at one pair of corresponding distal ends for coacting against a component member of an automobile for support, and spring means between said lever members for biasing said clamp means together;

a handle means provided at the opposite distal end of one of said lever members;

a sleeve means provided at the opposite distal end of the other of said lever members for receiving said stem; and

means formed on said other of said lever members adjacent said sleeve means for manual deformation to orient said sleeve means to a vertical position.

4,178,347

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF WET PROCESS PHOSPHORIC ACID AND SODIUM SILICOFLUORIDE

Ford T. Walker, Channahon, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed May 17, 1978, Ser. No. 906,889

Int. Cl.[2] C01B *25/22*

U.S. Cl. 423—185 **4 Claims**

1. A process for recovering fluorine and silicon values from a waste-water stream produced in a wet-process phosphoric acid process which comprises:

(a) diluting concentrated sulfuric acid with said waste-water stream and producing an SiF_4-containing gas during said dilution;

(b) scrubbing said SiF_4-containing gas with phosphoric acid to produce a phosphoric acid solution containing fluosilicic acid and recycling said phosphoric acid solution back to the wet process phosphoric acid process;

(c) reacting sodium carbonate with said phosphoric acid solution after step (b) to precipitate solid sodium silicofluoride; and

(d) separating said solid sodium silicofluoride from said phosphoric acid.

4,178,348

PROCESS FOR REMOVING SULFUR OXIDES IN EXHAUST GASES

Etsuo Asanagi, Kashiwa, and Hideo Idemura, Tokyo, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Company, Ltd., Kanagawa, Japan

Filed Jun. 9, 1977, Ser. No. 805,156

Claims priority, application Japan, Jun. 10, 1976, 51-67047

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A process for the desulfurization of exhaust gas containing sulfur oxides comprising contacting the exhaust gas with a slurry of gypsum acidified with sulfuric acid to a pH of 4–2.5 and which contains 0.05–0.5 mole/l of at least one metal sulfate selected from the group consisting of zinc, copper and magnesium sulfates in the presence of oxygen, in a single reaction means, while adding lime to the slurry so as to effect the absorption and oxidation of said sulfur oxides and the simultaneous deposition of gypsum.

4,178,349

PROCESS FOR DRY REMOVAL OF SULFUR DIOXIDE FROM COMBUSTION GASES

Fritz O. Wienert, 394 Roosevelt Ave., Niagara Falls, N.Y. 14305

Continuation of Ser. No. 700,717, Jun. 28, 1976, abandoned.

This application Sep. 6, 1977, Ser. No. 830,918

Int. Cl.[2] C01B *17/00;* B01J *8/00*

U.S. Cl. 423—244 **11 Claims**

1. In a process for removing sulfur dioxide from combustion gases of a steam-generating system that comprises a boiler, an economizer, an air preheater, a precipitator, and a stack, by reaction of the sulfur dioxide with dry particles of reactive lime-bearing materials, the improvement comprising: diverting the said combustion gases containing SO_2, prior to their passing said precipitator, from their normal flow path to a reaction chamber, retaining said gases in said reaction chamber with fine particles of dry reactive, lime-bearing materials for a reaction time longer than 2 seconds and not exceeding about 15 seconds while well and continuously mechanically agitating said gases and said particles whereby to maintain said particles in suspension, then passing said gases with said suspended particles from said reaction chamber to a settling chamber wherein the major portion of the solid particles are removed from the gases, said fine particles of dry, reactive lime-bearing materials comprising a product containing aggregates of fine particles obtained by grinding together a dry mixture of fresh, fine, reactive lime-bearing material and solid particles removed from said gases in said settling chamber, and then passing the said gases back into said normal flow path.

4,178,350

REMOVAL OF TRITIUM AND TRITIUM-CONTAINING COMPOUNDS FROM A GASEOUS STREAM

Martin F. Collins, Somerset, and Romuald Michalek, Hackensack, both of N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

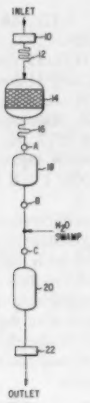
Filed Aug. 27, 1973, Ser. No. 391,862

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—248 **12 Claims**

1. A process for removing tritium from a gas stream comprising molecular tritium or compounds of tritium, said gas stream comprising at least one gas other than molecular protium and oxides thereof, and said gas stream containing tritium atoms in a larger concentration, on an atomic basis, relative to

protium atoms than its naturally-occurring relative concentration, said process comprising reacting said gas stream with at least sufficient oxygen to oxidize any molecular tritium and tritium-containing compounds to tritiated water, introducing the resulting oxidized stream into a first adsorption zone containing a desiccant and adsorbing therein said tritiated water to provide a first gaseous effluent which comprises constituents



of said gas stream or oxidation products thereof and a substantially reduced concentration of tritiated water, withdrawing said first gaseous effluent from said first adsorption zone, thereafter diluting said first effluent with ordinary water containing the naturally-occurring atomic ratio of protium to tritium, and subsequently introducing the thus-diluted effluent into a second adsorption zone containing a desiccant and adsorbing therein a mixture of tritiated water and ordinary water.

4,178,351
PROCESS FOR THE STABILIZATION OF SODIUM PERCARBONATE

Hans Klebe, and Gerd Knippschild, both of Rheinfelden, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 951,461

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748783

Int. Cl.² C01B *15/10*

U.S. Cl. 423—275 **9 Claims**

1. A process for stabilizing sodium percarbonate particles comprising mixing sodium percarbonate containing 1 to 10 weight % of water based on the percarbonate with dry highly dispersed silica and then drying to form sodium percarbonate particles having a surrounding jacket of sodium silicate.

4,178,352
SYNTHESIS OF TYPE Y ZEOLITE

David E. W. Vaughan, Columbia; Grant C. Edwards, Silver Spring, and Michael G. Barrett, Laurel, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 879,266, Feb. 21, 1978, abandoned, and a continuation-in-part of Ser. No. 880,194, Feb. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 822,310, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 742,943, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 653,695, Jan. 30, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,557

Int. Cl.² C01B *33/28*

U.S. Cl. 423—329 **5 Claims**

1. A process for preparing type Y zeolite comprising:

(a) preparing a slurry of zeolitic nucleation centers having an average particle size below about 0.1 micron, said slurry having the following mol ratio composition: 12 to 19 Na_2O; 0.7 to 9 Al_2O_3; 12 to 19 SiO_2; 220 to 900 H_2O;

(b) preparing an intermediate reaction mixture by combining the nucleation center composition of step (a) with additional sources of Na_2O, Al_2O_3, SiO_2 and H_2O to obtain a mixture having the following mol ratio composition: 2 to 6 Na_2O; 4.5 to 11 SiO_2; Al_2O_3; 30 to 200 H_2O;

(c) agitating and heating said intermediate reaction mixture of step (b) at a temperature of from about 30° to 80° C.;

(d) mixing an acid compound selected from the group comprising mineral acids, aluminum salts of mineral acids and mixtures thereof to the reaction mixture of step (c) to obtain a final reaction mixture having the following mol ratio composition: 0.5 to 2.5 $Na_n(A)$; 1.2 to 3 Na_2O; 4 to 7.5 SiO_2; Al_2O_3; 40 to 200 H_2O; wherein A is a mineral acid anion and n is the valence of A; and

(e) heating the final reaction mixture of step (d) to a temperature of from about 80° to 150° C. for from about 2 to 40 hours to obtain type Y zeolite.

4,178,353
PREPARATION AND PURIFICATION OF PHOSPHORYL CHLORIDE

Joseph W. Baker; Dario R. Cova, and James E. White, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 549,646, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 187,832, Oct. 8, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,895

Int. Cl.² C01B *25/10*

U.S. Cl. 423—300 **5 Claims**

1. In a process for preparing phosphoryl chloride by oxidation of phosphorus trichloride wherein the phosphoryl chloride product thus-afforded contains a residual amount of phosphorus trichloride, the improvement wherein said residual phosphorus trichloride is converted to phosphoryl chloride by contacting said phosphoryl chloride/phosphorus trichloride product mixture with undiluted ozone or an ozone-enriched gas containing from about 0.01 to about 4 percent ozone by volume for a time sufficient to afford phosphoryl chloride essentially free of phosphorus trichloride.

4,178,354
SEQUESTERING AGENT

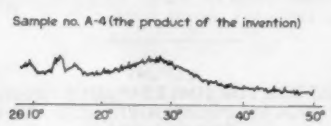
Moriyasu Murata, Chiba; Fumio Sai, Funabashi, and Takashi Fujino, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd, Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,794

Claims priority, application Japan, Dec. 28, 1976, 51/157719

Int. Cl.² C01B *25/26*

U.S. Cl. 423—306 **6 Claims**



1. Dry particles of a water-insoluble, alkali metal aluminosilicophosphate having the formula (I):

$$x(M_2O).Al_2O_3.y(SiO_2).z(P_2O_5).w(H_2O) \quad \text{(amorphous)} \qquad \text{(I)}$$

wherein M is an alkali metal selected from the group consisting of Na, K and Li, x, y, z and w are numbers representing the mole numbers of the respective components wherein x, y and z satisfy the following relations:

$0.2 \leqq x \leqq 1.10$,

$0.2 \leqq y \leqq 4.00$, and

$0.001 \leqq z \leqq 0.80$,

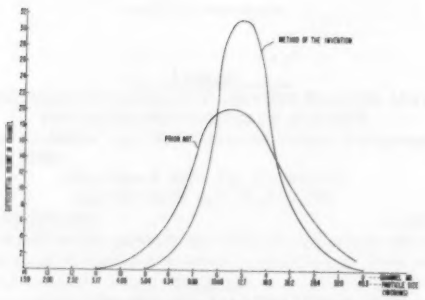
and w is zero or an optional positive number, said aluminosilicophosphate being amorphous as determined by X-ray diffraction, said aluminosilicophosphate having a calcium ion-sequestering capacity of at least 180 mg (as $CaCO_3$) per gram of said aluminosilicophosphate and a magnesium ion-sequestering capacity of at least 100 mg (as $CaCO_3$) per gram of said aluminosilicophosphate, said particles having an average particle size smaller than 100μ and an average specific surface area of at least about 50 m^2/g, measured by the BET adsorption isotherm method.

4,178,355

METHOD FOR PREPARING DICALCIUM ORTHOPHOSPHATE FOR USE IN FLUORESCENT LAMP PHOSPHORS

Herman R. Heytmeijer, Hanover Township, Morris County, N.J.; Larry P. Rusch, Salina, Kans., and Giuseppe Grasso, Parsippany Troy Hills, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1978, Ser. No. 878,852
Int. Cl.[2] C01B *25/32*
U.S. Cl. 423—308 **8 Claims**



1. A method of preparing anhydrous dicalcium orthophosphate of predetermined and substantially uniform particle size for making calcium halophosphate phosphors for use in fluorescent lamps, said method comprising:

(a) heating an acidified aqueous slurry of hydrated dicalcium orthophosphate ($CaHPO_4.2H_2O$) in a reaction vessel and simultaneously agitating said heated slurry within said vessel;

(b) continuing said heating and simultaneous agitation within said vessel until formation of a meta-stable gel-like material is manifested at the wall portions of said reaction vessel;

(c) discontinuing the application of heat to said slurry upon manifestation of said meta-stable gel-like material while continuing the agitation thereof within said vessel until all of said slurry is converted to said meta-stable gel-like material, at which time further agitation of the then-formed gel-like material is discontinued;

(d) maintaining said formed meta-stable gel-like material in a quiescent state until it converts completely to crystals of said anhydrous dicalcium orthophosphate, and permitting said orthophosphate crystals to settle to the bottom of residual liquid in said vessel; and

(e) separating said settled orthophosphate crystals from said residual liquid.

4,178,356

PROCESS FOR MANUFACTURING CHLORINE DIOXIDE

Morioki Shibuya, Shibukawa, and Isao Isa, Misato, both of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,989
Int. Cl.[2] C01B *11/02*
U.S. Cl. 423—478 **9 Claims**

1. A process for manufacturing chlorine dioxide, chlorine and an alkali metal chloride by the reaction of hydrochloric acid and the corresponding alkali metal chlorate in a single generator-crystallizer, comprising:

reacting an aqueous reaction medium containing (a) hydrochloric acid in a concentration of 0.01 to 0.23 normal, (b) said alkali metal chlorate in a concentration of 0.2 to 5 mol/l., (c) chloride ion in a concentration sufficient to saturate said reaction medium, (d) a chloropalladinate(II) complex catalyst or a mixed catalyst consisting of said chloropalladinate(II) complex catalyst and a compound or ions selected from the group consisting of vanadium pentoxide, manganese ions, dichromate ions, lead ions and arsenic ions, said chloropalladinate(II) complex having an absorption maximum wavelength longer than about 475 nm and being present at a concentration of 0.00001 to 0.001 g-atom/l based on palladium content and having an atomic ratio of said chloride ion to said palladium atom in said reaction medium of between about 4355 and 500,000, at a temperature of 25° to 90° C. under a reduced pressure of 20 to 400 mmHg,

evaporating water from said reaction medium, whereby a solid alkali metal chloride is formed,

withdrawing a gaseous mixture consisting of chlorine dioxide, chlorine and water vapor, and

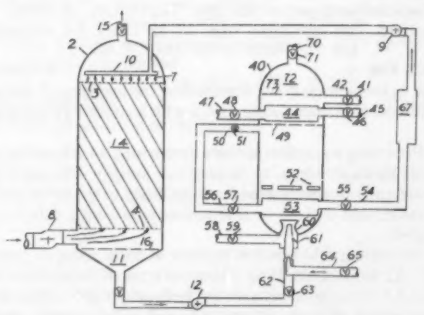
recovering said solid alkali metal chloride.

4,178,357

STRIPPING SULPHUR COMPOUNDS FROM STACK AND OTHER DISCHARGE GASES AND THE COMMERCIAL PRODUCTS DERIVED THEREFROM

Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212; Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Filed Nov. 28, 1977, Ser. No. 855,244
The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.
Int. Cl.[2] C01B *17/72*
U.S. Cl. 423—522 **5 Claims**



1. A method for production of sulphuric acid wherein a fuel combustor is coupled to a wet oxidation reactor, the said fuel combustor being operated with excess air in burning a fuel containing sulphur into flue gas, comprising the steps of

passing the flue gas through a scrubber in intimate contact

with $(C_8F_{17})_3N$, the said $(C_8F_{17})_3N$ having the inherent capability of absorbing sulphur dioxide and oxygen,

withdrawing the said $(C_8F_{17})_3N$ with absorbed sulphur dioxide and oxygen into the said wet oxidation reactor,

injecting water into the said wet oxidation reactor, and

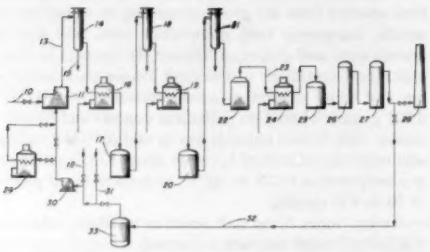
wet oxidizing sulphur dioxide in the presence of water into sulphuric acid.

4,178,358

SULFUR PLANT HEATUP PROCESS

George E. Smith, Parsippany, N.J.; Gregory L. Lorimor, Arvada, Colo.; Peter J. DeKluyver, Fullerton, and Henry E. McFarlin, Placentia, both of Calif., assignors to Conoco, Inc., Ponca City, Okla.

Filed Aug. 16, 1978, Ser. No. 934,238
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R 4 Claims



1. A process for heating up a modified Claus type sulfur recovery plant, comprised of a reaction furnace, a plurality of condensers, a plurality of catalytic converters, and heating means between at least one of said condensers and converters, prior to putting the plant on stream comprising:

(a) purging the plant with an inert gas;

(b) blocking in the purged plant; and

(c) circulating essentially inert gas through the blocked in plant while heating the circulating inert gas in an inert gas heating furnace prior to introducing heated circulating inert gas to said reaction furnace.

4,178,359

IMMUNOASSAY METHOD

Susan M. Mondabaugh, North Caldwell, and Magdalena U. Gomez, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 731,237, Oct. 12, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,849
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 10 Claims

1. In an immunoassay for determining the presence of microbial antibodies in mammalian serum which comprises the steps of:

A. Providing a reaction mixture comprising a buffered aqueous medium; serum to be sampled; antigen derived from said virus or microbes and anti-antibody to the serum to be tested, said antigen or anti-antibody bearing a detectable label;

B. Incubating said reaction mixture at from about 4° to 45° C. for from about 24 to 2 hours at a pH of from about 6.5 to 8.5 to form an antigen-antibody conjugate when said microbial antibody is present in said serum sample; and

C. Determining the level of said label as a measure of the presence of said antigen-antibody conjugate;

the improvement which comprises adjusting the volume ratio of anti-antibody to serum sample to a value sufficient to form an agglutinate but less than required to effectuate precipitation of the antigen-antibody conjugate.

4,178,360

RADIOLABELLED RUBELLA VIRUS AND METHOD

Roy Cleeland, Short Hills, N.J.; Joanne Durkin, Staten Island, N.Y., and Michael J. Kramer, Glen Ridge, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 15, 1978, Ser. No. 886,848
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 5 Claims

2. In an immunoassay for determining the presence of rubella virus specific antibodies in human serum which comprises the steps of:

A. Providing a reaction mixture comprising a buffered aqueous medium; human serum to be assayed; antigen derived from rubella virus and a second antibody specific to human IgG;

B. Incubating said reaction mixture to form an antigen-antibody-second antibody conjugate when said rubella virus specific antibody is present in said serum sample, said conjugate bearing a detectable label; and

C. Determining the level of said label as a measure of the presence of said antigen-antibody-second antibody conjugate and correlating said level against a standard curve to determine whether positive levels of said rubella virus specific antibody were present in said serum sample;

the improvement which comprises utilizing ^{125}I-rubella virus as the antigen.

4,178,361

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION

Arthur I. Cohen; James S. Y. Sim; Maurice H. Van Horn; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Continuation of Ser. No. 395,861, Sep. 10, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,494
Int. Cl.[2] A61K *9/22*
U.S. Cl. 424—22 14 Claims

1. A sustained release pharmaceutical composition comprising:

(A) a pharmacological material in an amount at least sufficient for the total dosage during a treatment period;

(B) a biological binding agent for said pharmacological material, said biological binding agent containing bonding sites complementary to bonding sites of the pharmacological material in an amount effective to bind the pharmacological materials and to provide for the sustained release of said pharmacological material in the desired dosage amount;

(C) a matrix of a water-insoluble but water-swellable hydrophilic polymer, which holds said biological binding agent;

(D) the molecular size or weight of the biological binding agent being sufficient to cause retention of said biological binding agent in said matrix and to prevent egress of said biological binding agent from said matrix during the treatment period.

4,178,362

ENZYMATIC DENTIFRICES

Hendrik Hoogendoorn, Krimpen aan den Ijssel; Rutger Matthijsen, and Huibert C. T. Moelker, both of Oss, all of Netherlands, assignors to Telec S.A., Geneva, Switzerland

Continuation of Ser. No. 870,815, Jan. 19, 1978, abandoned, which is a continuation of Ser. No. 651,862, Jan. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 349,317, Apr. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,390, Jul. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 39,887, May 22, 1970, abandoned. This application Nov. 9, 1978, Ser. No. 959,162
Claims priority, application Netherlands, Jun. 3, 1969, 6908379
Int. Cl.[2] A61K *9/68, 7/28*
U.S. Cl. 424—48 7 Claims

1. An enzyme dentifrice chewing gum or tablet consisting of about 0.5 to about 20 units per gram/milliliter of glucose oxidase enzyme which forms hydrogen peroxide by oxidative decomposition of a glucose substrate provided by glucose present in sufficient amount in saliva and tooth plaque, said hydrogen peroxide being formed in a continuous concentration no greater than 10^{-4}%, said unit being the quantity of the enzyme which will oxidize 1 micromol of substrate per minute at 30° C. and pH 6, effective when applied to a dental surface exhibiting a pH below the neutral range, to restore the pH at said dental surface to an approximately neutral range, and

a pharmaceutically acceptable carrier.

4,178,363

METHOD FOR REDUCING DENTAL PLAQUE AND PELLICLE PRECURSOR OF PLAQUE

Taylor C. Miller, Jr., 210 Professional Center, Montgomery, Ala. 36104

Filed May 9, 1978, Ser. No. 904,335
Int. Cl.[2] A61K *7/16, 7/24, 31/20*
U.S. Cl. 424—49 1 Claim

1. A method for reducing dental plaque and pellicle precursor of plaque comprising brushing or irrigating the teeth with a dental preparation containing an active ingredient, the active ingredient consisting essentially of 2% by weight of undecylenic acid and 2% by weight of zinc undecylenate.

4,178,364

ART OF SHAVING

Jimmy Rucker, 400 E. 33rd St., Apt. 1401, Chicago, Ill. 60616

Filed Aug. 8, 1975, Ser. No. 603,145
Int. Cl.[2] A61K *7/15;* B26D *7/08*
U.S. Cl. 424—73 2 Claims

1. A method of shaving with a razor in which the skin is first washed clean and wet with water to provide a colorless transparent first liquid phase over the clean skin area from which the hair is to be shaved with the razor, spreading a drop of water-immiscible fluid consisting of a mixture of dimethyl polysiloxanes having a viscosity of 600 to 700 centistokes across the length of the razor edge to produce a trasparent colorless second liquid phase which adheres to the razor edge and is repellent to the first liquid phase, and moving the dimethyl-polysiloxane-coated razor edge across the water-wet area of the skin, a sharply defined low frictional interface being created between the two liquid phases such that the razor edge slides smoothly across the skin in the shaving act and cuts cleanly close to the skin with minimal pull on the hair and frictional resistance between the skin and the razor edge.

4,178,365

METHOD OF PREPARING AN ANTIPARASITIC IMMUNOLOGICAL AGENT, THE PRODUCT OBTAINED, AND ITS APPLICATION

Daniel Bout, Le Maisnil, France, assignor to Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N.S.E.R.M., Paris and Institut Pasteur, Lille, both of, France

Filed Jul. 11, 1977, Ser. No. 814,211
Int. Cl.[2] A61K *39/00*
U.S. Cl. 424—88 11 Claims

1. A method of preparing an antischistosomic immunological agent from human or animal schistosomes, comprising the steps of

obtaining a total extract of antigens of schistosomes, the antigens being target antigens of the schistosomes with respect to a schistosomicidal drug,

contacting a schistosomicidal drug, which is a ligand, with the total extract, whereby the target antigens become fixed on the drug as target antigens bound to the ligand.

7. An antischistosome immunological agent comprising principally a schistosome extract constituting target antigens of a schitosomicidal drug.

4,178,366

NEMATODE LARVAE AS BIOLOGICAL INSECTICIDES

Robin A. Bedding, Taroona, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

Continuation of Ser. No. 715,590, Aug. 18, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 909,404
Claims priority, application Australia, Aug. 26, 1975, 2930/75
Int. Cl.[2] A01N *15/00*
U.S. Cl. 424—93 20 Claims

1. A formulation for use in the biological control of insects, comprising mineral oil as a suspension medium containing an insecticidal amount of a larval stage of nematodes infective and parasitic to the larvae of said insects and a wax or wax-like material in an amount effective to reduce water loss from said formulation, said formulation substantially not containing any free water but retaining the body moisture of said nematodes.

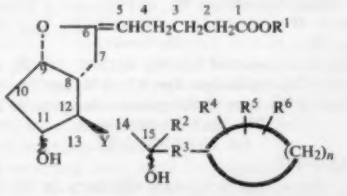
4,178,367

PROSTAGLANDIN I_2 ANALOGUES

Hayashi Masaki, Takatsuki; Yoshinobu Arai, Toyonaka; Yoshitaka Konishi; Katsuichi Shimoji, both of Takatsuki; Shuichi Ohuchida, Kyoto; Hiroyuki Ito, Suita, and Hirohisa Wakatsuka, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

Filed Feb. 16, 1978, Ser. No. 878,571
Claims priority, application Japan, Feb. 21, 1977, 52/017141; Mar. 22, 1977, 52/030494
Int. Cl.[2] A61K *31/34;* C07D *307/93*
U.S. Cl. 424—285 21 Claims

1. A prostaglandin of the formula:



wherein Y is trans-vinylene or ethylene, R^1 is hydrogen or straight- or branched-chain alkyl of from 1 to 12 carbon atoms, R^2 is hydrogen, methyl, or ethyl, R^3 is a single bond, or straight- or branched-chain alkylene of from 1 to 4 carbon

atoms, R^4, R^5 and R^6, which may be the same or different, are each hydrogen, or straight- or branched-chain alkyl of from 1 to 8 carbon atoms, n is 3, 4, 5, or 6, the wavy line ≈ attached to the carbon atoms in positions 11 and 15 depicted in the formula show that the perspective hydroxyls attached to the said positions have the α- or β-configuration or a mixture thereof, and the double bond between C_5–C_6 is Z or E and, when R^1 is hydrogen, non-toxic salts thereof.

21. A pharmaceutical antithrombotic or hypotensive composition which comprises, as active ingredient, an antithrombotic or hypotensive amount of at least one compound as claimed in claim **1** in association with a pharmaceutical carrier or coating.

4,178,368

METHOD FOR THE TREATMENT OF THROMBOEMBOLISM

Norbert Heimburger; Hansjörg Ronneberger, and Manfred Schick, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 850,808, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 736,831, Oct. 29, 1976, abandoned, which is a continuation of Ser. No. 293,213, Sep. 28, 1972, abandoned. This application Jun. 21, 1978, Ser. No. 917,583

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1971, 2148865

Int. Cl.[2] **A61K** *37/48*

U.S. Cl. 424—94 **2 Claims**

1. A method for the treatment of thromboembolisms in a patient, said method consisting essentially of intravenously administering to said patient an effective amount of a complex formed between streptokinase and plasminogen in a mol ratio from 2:1 to 1:2 in combination with a physiologically tolerable aqueous liquid diluent.

4,178,369

FEEDING TURKEYS

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 786,419, Apr. 11, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,113

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 424—177 **6 Claims**

1. A process of improving feed efficiency in the raising of turkeys which comprises feeding turkeys with a mixed turkey feed containing 0.1% to 0.3% by weight of sodium diacetate and dehydrated whey wherein the weight ratio of sodium diacetate to dehydrated whey is within the range of 25:1 to 1:4 thereby to enhance the feed efficiency of the feed.

4,178,370

FEEDING PIGS

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 817,001, Jul. 18, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,112

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 424—177 **5 Claims**

1. A process of improving feed efficiency in the raising of pigs which consists essentially in feeding pigs with a mixed pig feed and from 0.1% to 0.4% by weight of sodium diacetate and dehydrated whey wherein the weight ratio of sodium diacetate to dehydrated whey is within the range of 25:1 to 1:4 whereby to enhance the feed efficiency of the feed.

4,178,371

TETRAPEPTIDE DERIVATIVES

Barry A. Morgan, Hessle, England, assignor to Reckitt & Colman Products Limited, London, England

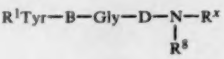
Filed Nov. 27, 1978, Ser. No. 964,074

Claims priority, application United Kingdom, Dec. 15, 1977, 52237/77; Apr. 8, 1978, 13845/78

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **14 Claims**

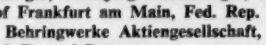
1. A compound of the formula:



wherein

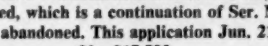
R^1 is hydrogen, methyl, allyl, dimethylallyl, propargyl, cyclopropylmethyl, cyclobutylmethyl or phenethyl;

B is the group



in which R^3 is alkyl C_{1-6} or $C_qH_{2q}YC_rH_{2r+1}$ (where q is 1-2, r is 0-1 and Y is O, S, SO or SO_2); the group having the D-configuration;

D is the group



in which

R^5 is hydrogen or methyl;

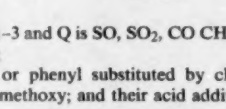
R^6 Ar-alkyl C_{1-3};

the group having the L-configuration;

R^8 is hydrogen, alkyl C_{1-5}, Ar or Ar-alkyl C_{1-2};

R^x is a group $(CH_2)_s$—X where s is 2-4 and X is NHR^9, $N\oplus R^{11}R^{12}R^{13}$, NR^9COR^{11}, NR^9COOR^{11}, NR^9CONH_2, $NR^9CONR^{10}R^{11}$, $N(O)_nR^{11}R^{12}$, $COOR^9$, $CONR^9R^{10}$, or $OCONR^9R^{10}$ (where R^9 is hydrogen, alkyl C_{1-3}, Ar or $ArCH_2$;

R^{10} is hydrogen or alkyl C_{1-3}; R^{11} is alkyl C_{1-3}, Ar or $ArCH_2$; R^{12} is alkyl C_{1-3}; R^{13} is alkyl C_{1-3}; and n is 0 or 1); or the group



where m is 1–3 and Q is SO, SO_2, CO CHOH, $N\oplus MeR^{11}$ or $N(O)R^{11}$;

Ar is phenyl or phenyl substituted by chlorine, methyl, hydroxy or methoxy; and their acid addition salts.

4,178,372

HYPOALLERGENIC STABILIZED ALOE VERA GEL

Billy C. Coats, 1419 Mapleton, Dallas, Tex. 75228

Filed Mar. 6, 1978, Ser. No. 883,749

Int. Cl.[2] **A61K** *35/78, 7/26, 47/00*

U.S. Cl. 424—195 **15 Claims**

1. A process for stabilizing a clear gel from the leaf of aloe vera comprising:

(a) mechanically separating aloe vera gel matrix from the outer cortex of aloe vera leaf;

(b) extruding said gel matrix through a filter to thereby remove particles of aloe vera leaf therefrom;

(c) heating said aloe vera gel matrix to a temperature within the range of from about 35 degrees C. to about 80 degrees C. and adding thereto a catalytic amount of hydrogen peroxide to thereby cause said gel to oxidize and assume a lighter appearance;

(d) adding ascorbic acid to said gel in an amount of from

about 0.015 to about 0.5 ounce per gallon of said gel to thereby arrest catalytic oxidation;

(e) adding an amount of citric acid to said gel effective to maintain the pH of said gel solution at a value of between from about 4 to 6.

11. The product produced by the process of claim **1**.

4,178,373

COAL TAR GEL COMPOSITION

Robert W. Klein, Blue Bell, and Mary E. Foxx, Lansdale, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Aug. 21, 1978, Ser. No. 935,341

Int. Cl.[2] **A61K** *31/615, 31/00, 31/05, 47/00*

U.S. Cl. 424—233 **7 Claims**

1. In a coal tar gel composition for topically treating eczema or psoriasis containing a gelling agent and from about 0.5 to about 20% by weight based on said composition of coal tar, the improvement which comprises including the combination of from about 2 to about 10% by weight based on said composition of a fatty acid derivative of sarcosine, said fatty acid having from 6 to 16 carbons, and from about 25 to about 75% by weight based on said composition of a glyceryl ester of a fatty acid having 6 to 22 carbon atoms; said glyceryl ester having a melting point of about −20° to +80° C.

7. A method for treating eczema or psoriasis in humans which comprise topically administering an effective amount of the composition of claim **1**.

4,178,374

NOVEL PHARMACEUTICAL COMPOSITIONS OF β-BLOCKERS WITH DIURETICS

Charles S. Sweet, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 734,702, Oct. 21, 1976, which is a continuation-in-part of Ser. No. 554,373, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 497,961, Aug. 16, 1974, abandoned. This application Apr. 10, 1978, Ser. No. 896,066

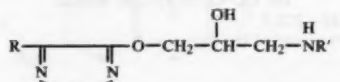
Int. Cl.[2] **A61U** *31/00;* **A61K** *31/54, 31/495*

U.S. Cl. 424—246 **20 Claims**

1. A method of treating a hypertensive animal to reduce blood pressure which comprises administration to said animal of a blood pressure reducing amount of a composition comprising:

(A) β-blocking agent selected from:

(i) compounds having the formula



wherein R is morpholino and R′ is selected from C_1–C_{10} alkyl, C_2–C_6 alkynyl, C_2–C_4 alkenyl, C_1–C_4 alkylthio, C_3–C_6 cycloalkyl and heterocycle

(ii) non-toxic pharmaceutically acceptable salt of (i); and

(iii) mixtures containing (i) and (ii); and

(B) diuretic mixture containing

(a) thiazides or their pharmaceutically acceptable salt and

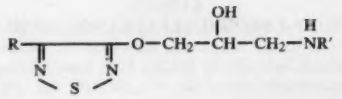
(b) amiloride or its pharmaceutically acceptable salt

wherein the weight ratio of (A):(B) is about 1:1 to about 1:10.

6. Composition comprising:

(A) β-blocking agent selected from:

(i) compounds having the formula



wherein R is morpholino and R′ is selected from C_1–C_{10} alkyl, C_2–C_6 alkynyl, C_2–C_4 alkenyl, C_1–C_4 alkylthio, C_3–C_6 cycloalkyl and heterocycle,

(ii) non-toxic pharmaceutically acceptable salt of (i); and

(iii) mixtures containing (i) and (ii); and

(B) diuretic mixture containing

(a) a 1,2,4-benzothiadiazine or their pharmaceutically acceptable salt, and

(b) amiloride or its pharmaceutically acceptable salt

wherein the weight ration of (A):(B) is about 1:1 to about 1:10.

4,178,375

PRESERVING AND DISINFECTING METHOD EMPLOYING CERTAIN OXAZINES

Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

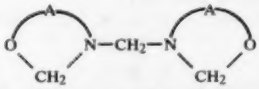
Division of Ser. No. 819,245, Jul. 27, 1977, Pat. No. 4,148,905. This application Aug. 17, 1978, Ser. No. 934,792

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635389

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 424—248.4 **3 Claims**

1. A method for preventing or retarding the growth of bacteria and fungi in a material susceptible to bacterial and fungal contamination which comprises treating the inanimate material with an antibacterially and antifungally effective amount of a compound of the formula



where A is 1,3-alkanediyl having from 3 to 10 carbon atoms.

4,178,376

METHOD FOR INDUCING RAPID THERAPEUTICALLY EFFECTIVE ANTIMALARIAL LEVELS OF CERTAIN SELECTED CONVENTIONAL ANTIMALARIALS

Takeru Higuchi, and Siegfried Lindenbaum, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Jan. 21, 1977, Ser. No. 760,859

Int. Cl.[2] **A61K** *31/47, 9/42, 31/44, 31/135*

U.S. Cl. 424—258 **10 Claims**

1. A method for inducing rapid therapeutically effective blood levels of 6,8-Dichloro-α-(dibutylaminomethyl-2-(3′,4′-dichlorophenyl)-4-quinolinemethanol, in a warm-blooded animal afflicted with malaria which comprises administering to said animal a composition consisting essentially of:

(a) an effective antimalarial amount of 6,8-Dichloro-α-(dibutylaminomethyl-2-(3′,4′-dichlorophenyl)-4-quinolinemethanol, dissolved in,

(b) a solubilizing amount of an organic fatty acid of the formula: R—COOH, wherein R represents a member selected from the group consisting of a saturated aliphatic hydrocarbon group of from seven to twenty carbon atoms and a mono-, di-, tri-, or tetra-unsaturated aliphatic hydrocarbon group of from seven to twenty carbon atoms.

4,178,377
(4-HYDROXY-4-PIPERIDYL)-ALKANOIC ACID AMIDES

Erwin Rissi, Basel, and Anton Ebnöther, Arlesheim, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

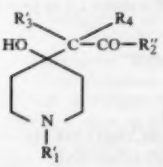
Continuation-in-part of Ser. No. 650,105, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 479,850, May 14, 1974, abandoned. This application Aug. 19, 1977, Ser. No. 826,201

Claims priority, application Switzerland, Jun. 22, 1973, 9177/73; Jun. 28, 1973, 9414/73; Jun. 29, 1973, 9509/73; Jul. 2, 1973, 9598/73; Mar. 21, 1975, 3649/75; Mar. 21, 1975, 3650/75; Jan. 9, 1976, 215/76

Int. Cl.[2] A61K *31/445;* C07D *211/48*

U.S. Cl. 424—267 12 Claims

1. A compound of the formula



wherein

R_1' is phenethyl or phenethyl monosubstituted in the phenyl ring by fluorine, chlorine, bromine, lower alkyl or lower alkoxy,

R_2'' is

wherein

R_6'' is lower alkyl, and

R_7'' is cycloalkyl,

R_3' is lower alkyl, and

R_4 is hydrogen or lower alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

4,178,378
ETHERIFIED TRIAZOLOBENZODIAZEPINE DERIVATIVES

Hans Allgeier, Lörrach-Haagen, Fed. Rep. of Germany, and André Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

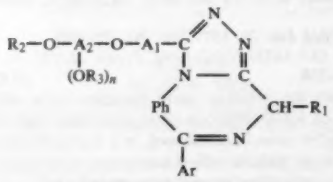
Filed Sep. 15, 1977, Ser. No. 833,421

Claims priority, application Luxembourg, Sep. 20, 1976, 75836

Int. Cl.[2] A61K *31/55, 31/62;* C07D *487/04*

U.S. Cl. 424—269 32 Claims

1. An etherified diazepine derivative of the formula

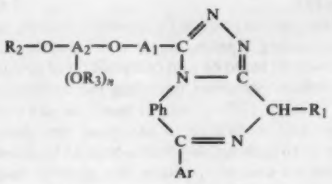


(I)

in which R_1 represents hydrogen or alkyl having up to 3 carbon atoms, R_2 and R_3 independently of one another each represent hydrogen or alkyl having up to 7 carbon atoms, or represent the partial formula R_4—$(OCH_2$—$CH_2)_m$, in which R_4 represents hydrogen or alkyl having up to 7 carbon atoms and m represents the number 1 to 3, A_1 represents alkylidene or alkylene having up to 3 carbon atoms, A_2, depending on the meaning of n, represents alkylene or alkanetriyl having 2 to 5 carbon atoms, no carbon atom in the radical A_2 being bonded to more than one oxygen atom, n represents the number 0 or 1, Ph represents 1,2-phenylene which is unsubstituted or substituted in 8-position by lower alkyl, lower alkoxy, halogen having an atomic number up to and including 35, or trifluoromethyl, and Ar represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen having an atomic number of up to and including 35, or trifluoromethyl in o-position.

10. 8-Chloro-6-(o-chlorophenyl)-1-[(2,2-dimethyl-1,3-dioxolan-4-yl)-methoxy-methyl]-4H-s-triazolo[4,3-a][1,4]-benzodiazepine.

13. A pharmaceutical composition useful in the treatment of states of epilepsy, stress and agitation in a warm-blooded animal, comprising a therapeutically effective amount of a compound according to claim 1, which corresponds to the formula



(I)

in which R_1 represents hydrogen or alkyl having up to 3 carbon atoms, R_2 and R_3 independently of one another each represent hydrogen or alkyl having up to 7 carbon atoms, or represent the partial formula R_4—$(OCH_2$—$CH_2)_m$, in which R_4 represents hydrogen or alkyl having up to 7 carbon atoms and m represents the number 1 to 3, A_1 represents alkylidene or alkylene having up to 3 carbon atoms, A_2, depending on the meaning of n, represents alkylene or alkanetriyl having 2 to 5 carbon atoms, no carbon atom in the radical A_2 being bonded to more than one oxygen atom, n represents the number 0 or 1, Ph represents 1,2-phenylene which is unsubstituted or substituted in 8-position by lower alkyl, lower alkoxy, halogen having an atomic number up to and including 35, or trifluoromethyl, and Ar represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen having an atomic number of up to and including 35, or trifluoromethyl in o-position, or an addition salt thereof, together with a pharmaceutical carrier.

4,178,379
SUBSTITUTED PYRANO[4,3-c]PYRAZOLES, COMPOSITIONS CONTAINING SAME, AND METHOD OF USE

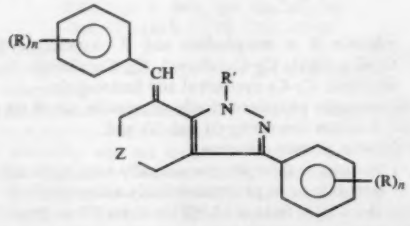
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 7, 1978, Ser. No. 913,268

Int. Cl.[2] C07D *491/04, 495/04*

U.S. Cl. 424—273 P 14 Claims

1. A compound of the structure



wherein Z is O, S, SO or SO_2, n is 1 or 2, R is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl, aroyl,

cyano or trifluoromethyl, and R' is hydrogen, lower alkyl, aryl-lower alkyl, aryl, or halo-lower alkyl.

4,178,380

BENZOPYRANCARBOXAMIDES

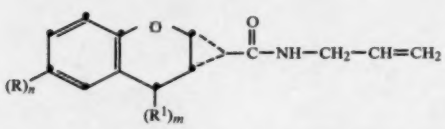
John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 778,534, Mar. 17, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,400

Int. Cl.[2] A61K *31/35;* **C07D** *311/12*

U.S. Cl. 424—283 **10 Claims**

1. A compound of the formula



(I)

wherein n is zero or one, R is halogen; nitro; amino; trifluoromethyl; methylsulfonylamino; alkyl or alkoxy of from one to six carbon atoms; cycloalkyl of from three to six carbon atoms; phenyl, phenoxy, benzyl or 2-phenethyl, or any of these substituted by one or two of one or more of alkyl of from one to six carbon atoms, halogen and nitro; m is zero or one, and R^1 is hydroxyl, with the proviso that when m is one, the compound is in the cis isomeric configuration, the dotted lines indicating that 2-propenylaminocarbonyl moiety is bonded to the benzopyran ring at the 2-position or at the 3-position.

7. A method for inhibiting lipogenesis in a mammal, which comprises administering to a mammal in need of such treatment, orally or parenterally, an effective amount of a compound defined in claim 1.

4,178,381

C-HOMOESTRATRIENES

Gregor Haffer; Ulrich Eder; Gerhard Sauer; Rudolf Wiechert; Yukishige Nishino, and Günter Neff, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

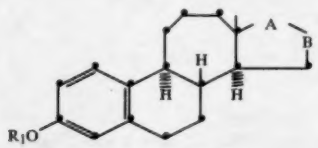
Filed Dec. 4, 1978, Ser. No. 966,162

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2755578

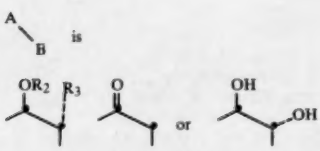
Int. Cl.[2] A61K *31/05, 31/085, 31/12*

U.S. Cl. 424—283 **19 Claims**

1. A C-homoestratriene of the formula



wherein



R_1 and R_2 are the same or different, and each is hydrogen, a conventional physiologically compatible acyl group derived from a hydrocarbon carboxylic or sulfonic acid, C_{1-5}alkyl, C_{3-8}cycloalkyl or tetrahydropyranyl, and R_3 is hydrogen, ethynyl or chloroethynyl.

4,178,382

N-SUBSTITUTED TRIORGANOSTANNYLHYDRO-CARBYLCARBOXYLIC ACID HYDRAZIDES

Chung-Ling Mao, Sandy Hook; Richard J. Strunk, Cheshire, and Winchester L. Hubbard, Woodbridge, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,143

Int. Cl.[2] C01B *6/13, 6/22, 35/00*

U.S. Cl. 424—288 **21 Claims**

1. A compound having the formula $R_3SnACONR^1X$, wherein R is C_1–C_4 alkyl, C_3–C_6 cycloalkyl, or C_6–C_{10} aryl; A is C_1–C_5 alkylene or C_8 aralkylene; R^1 is hydrogen, C_1–C_{12} alkyl, C_7–C_9 aralkyl, C_2–C_{12} alkanoyl, C_7–C_{11} aroyl, or C_1–C_{12} alkyl substituted with hydroxy, cyano, C_1–C_{14} alkoxycarbonyl, C_1–C_4 alkylsulfonyl, C_6–C_{10} arylsulfonyl, C_1–C_4 alkanoyl, C_6–C_{10} aroyl, or C_5–C_6 2-hydroxycycloalkyl; and X is $—NR^2R^3$, $—N{=}CR^4R^5$, $—NR^6COR^7$, or $—NR^8CYNR^9R^{10}$, wherein Y is divalent oxygen or sulfur; R^2 and R^3 may be the same or different and are hydrogen, provided that one of R^2 and R^3 is other than hydrogen, or are 2-hydroxycyclohexyl, substituted or unsubstituted C_1–C_{17} alkyl, the substituents being the same or different and being hydroxy, C_6–C_{10} aryl, C_1–C_4 alkoxy, C_7–C_{11} alkoxyaryloxy, tetrahydropyranyloxy, phenylsulfonylethyl, phenyl substituted with halogen, C_1–C_{18} alkyl, C_6–C_{10} aryl, C_1–C_4 alkoxy, or phenoxy, or are $—R^{11}OOCNR^{12}R^{13}$, wherein R^{11} is C_3–C_6 cycloalkylene, substituted or unsubstituted C_2–C_{12} alkylene, the substituents being the same or different and being C_6–C_{10} aryl, C_1–C_4 alkoxy, C_7–C_{11} alkoxyaryloxy, or tetrahydropyranyloxy; R^{12} is C_1–C_{18} alkyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, or phenyl substituted with halogen or with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_2–C_6 alkoxycarbonyl, trifluoromethyl or C_1–C_4 alkylphenylsulfonyl; and R^{13} has the meanings of R^1 above; or R^2 and R^3 are joined together forming C_4–C_6 alkylene, C_4–C_6 oxydialkylene or methylenebis(aminomethylene)-N,N'-bis(3-trimethylstannyl-ethylcarbonylamino); R^4 and R^5 may be the same or different and are hydrogen, provided that one of R^4 and R^5 is other than hydrogen, or are C_1–C_{11} alkyl, C_3–C_{10} cycloalkyl, C_7–C_{12} bicycloalbenyl C_7–C_{11} aralkyl, C_8–C_{10} arylalkenyl, C_6–C_{10} aryl, furyl, pyridyl indolyl, dihydropyranyl, or phenyl substituted with C_1–C_8 alkyl, hydroxy, halogen, C_1–C_8 alkoxy, methylenedioxy, C_6–C_{10} aryloxy, benzyloxy, C_2–C_8 dialkylamino, C_1–C_8 alkylamino, C_6–C_{12} arylamino, cyano, or nitro, or R^4 and R^5 are joined together forming C_2–C_5 alkylene; R^6, R^8 and R^{10} may be the same or different and have the meanings of R^1 above; R^7 is C_1–C_{17} alkyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, C_8–C_{10} aralkenyl, furyl, phenothiazin-10-yl, trimethylstannylethyl, or phenyl substituted with halogen, C_1–C_4 alkyl, C_6–C_{10} aryl, C_1–C_4 alkoxy, phenylazo, carboxy, nitro, alkali metal carboxy, or C_2–C_{12} alkoxycarbonyl, or R^7 is a pyridylenebis(carbonylamino) group connecting two $R_3SnACONR^1$— groups, wherein R, A, and R^1 are as defined above; R^9 is C_1–C_{18} alkyl, C_3–C_5 alkenyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, C_3–C_8 alkoxycarbonylalkyl, C_7–C_9 aralkyl, or phenyl substituted with halogen, C_1–C_{12} alkyl, C_1–C_4 alkoxy, nitro, cyano, trifluoromethyl, or alkali metal sulfo.

4,178,383
FUNGICIDALLY ACTIVE OXIME-ETHERS OF ISONITROSOCYANOACETAMIDES

Wilhelm Brandes, Cologne; Werner Daum, Krefeld, and Peter Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

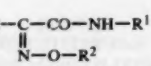
Filed May 12, 1977, Ser. No. 796,503

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623847; Dec. 16, 1976, 2657145

Int. Cl.[2] C07C *121/52, 121/66;* **A01N** *9/20*

U.S. Cl. 424—304 **15 Claims**

1. An oxime-ether of isonitrosocyanoacetamide of the formula



in which

R^1 represents hydrogen or the —CO—NHR^3 group, wherein

R^3 is hydrogen or alkyl with up to 4 carbon atoms, and

R^2 represents phenyl which carries one or more substituents selected from nitro, trifluoromethyl and cyano groups and optionally carries one or more halogen substituents; or represents benzyl which carries one or more substituents, on the aromatic part, selected from benzoyl, monohalogenobenzoyl dihalogenobenzoyl, phenyl and alkoxy with 1 to 14 carbon atoms; or represents phenylaminocarbonyl-methyl or diphenylaminocarbonyl-methyl optionally substituted on the methyl radical by 1 or 2 alkyl groups each with up to 4 carbon atoms and on the phenyl nucleus by at least one of halogen and/or alkyl with up to 6 carbon atoms.

14. A method of combating fungi which compriss applying to the fungi, or to a habitat thereof, a fungicidally effective amount of an ether according to claim 1.

4,178,384
PYRETHROID INSECT REPELLENT

Kenneth J. Ensing, deceased, late of Middleport, N.Y. (by Lois K. Ensing, executrix), assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 669,371, Mar. 22, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 758,981

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—305 **6 Claims**

1. A method of repelling a species of insect from a locus to which said species of insect is normally attracted which comprises depositing on said locus a non-toxic effective insect repellent amount of a formulation consisting essentially of no more than about 0.2% by weight 3-phenoxybenzyl 3-(β,β-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and no other cyclopropanecarboxylate or synergist therefor in intimate admixture with a carrier or diluent therefor.

4,178,385
METHOD FOR TREATING HYPERLIPIDEMIA IN PRIMATES USING 4-((4-FLUOROPHENYLMETHYL)AMINO)BENZOIC ACID

Eugene R. Wagner, Carmel, and Alfred A. Renzi, Zionsville, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1978, Ser. No. 883,091

Int. Cl.[2] A61K *31/195, 31/205, 31/24*

U.S. Cl. 424—310 **5 Claims**

1. A method for lowering serum lipid levels in a primate which comprises administering internally to the primate an effective hypolipidemic amount of the compound 4-((4-fluorophenylmethyl)amino)benzoic acid, a pharmaceutically-acceptable salt or a lower ester thereof.

4,178,386
INHIBITORS OF GLYCOLIC ACID OXIDASE

Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, and Clarence S. Rooney, Worcester, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 11, 1978, Ser. No. 950,754

Int. Cl.[2] A61K *31/19*

U.S. Cl. 424—317 **2 Claims**

1. A method of treating or preventing the formation of calcium oxalate kidney or bladder stones which comprises administering to a patient with or prone to this disease an effective amount of 2-hydroxy-3-butynoic acid or a pharmaceutically acceptable salt or lower alkyl ester thereof.

4,178,387
METHOD FOR THE TREATMENT OF ARRHYTHMIA

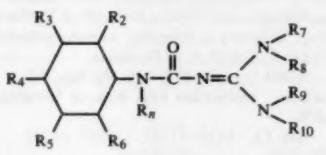
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Malvern, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 671,762, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Jan. 10, 1978, Ser. No. 868,568

Int. Cl.[2] A61K *31/17, 31/33, 31/54, 31/535*

U.S. Cl. 424—322 **18 Claims**

1. A method for the treatment of arrhythmia in a patient suffering from arrhythmia which comprises administering to said patient an effective daily dosage of between 0.1 and 70 mg/kg of body weight of said patient a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl having 1–5 carbon atoms,
halologeralkyl having 1–5 carbon atoms,
nitro,
amino, acetylamino or
loweralkoxy having 1–5 carbon atoms and

R_n is hydrogen or
loweralkyl having 1–5 carbon atoms;

R_7, R_8, R_9 and R_{10} are:
hydrogen,
alkyl having 1–5 carbon atoms,
alkenyl having 3–7 carbon atoms,
alkynyl having 3–7 carbon atoms,
cycloalkyl having 3–7 carbon atoms,
cycloalkenyl having 5–7 carbon atoms,
cycloalkylloweralkyl, said cycloalkyl having 3–7 carbon atoms and said loweralkyl having 1–5 carbon atoms,
methoxyethyl,
ethoxyethyl or
benzyloxyethyl;

and the non-toxic acid addition salts thereof.

4,178,388

NOVEL RODENTICIDAL COMPOSITIONS EMPLOYING CHLOROPHACINONE

Jean-Claude Lechevin, Lyons, France, assignor to Lipha-Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation of Ser. No. 389,114, Aug. 17, 1973, abandoned. This application Sep. 10, 1975, Ser. No. 611,908
Claims priority, application France, Aug. 21, 1972, 72.29765
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—331 9 Claims

1. A rodenticidal composition for use as a spray when diluted with water, comprising a solution of 2-(α-p-chlorophenyl-α-phenylacetyl)-1,3-indanedione in an amount of from 5–10% by weight, in a liquid monocyclic aromatic hydrocarbon solvent which is benzene or benzene substituted by at least one straight-chain or branched-chain saturated alkyl radical selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec. butyl, tert. butyl, amyl, isoamyl, sec. amyl, tert. amyl and isohexyl, the said liquid solvent being present in an amount of from 75–85% by weight, in the presence of an emulsifier in an amount of from 2–20% by weight.

4,178,389

ALCOHOLIC BEVERAGE MAKING COMPOSITION AND PROCESS

Donald P. Pilla, 648 Cedar Ave., Burlington, Ontario, Canada

Filed Mar. 28, 1978, Ser. No. 890,932
Claims priority, application Canada, May 27, 1977, 279366
Int. Cl.[2] C12C *5/00, 5/04*
U.S. Cl. 426—11 8 Claims

1. A composition of matter suitable for preparing an alcoholic beverage or mixing with fermentable sugar and water and fermenting, said composition comprising:

(i) the dried granular product obtained by mixing with water to form a semi-solid, non-flowing paste a yeast nutrient combination comprising from about 3 to about 5 parts by weight ammonium phosphate, from about 3 to about 5 parts by weight urea, from about 1.5 to about 3.5 parts by weight monobasic potassium phosphate, and from about 0.5 to about 1.5 parts by weight tricalcium phosphate, drying the paste and granulating the dried product so obtained; in admixture with (ii) a combination of flavor conferring and fermentation ingredients comprising from about 3 to about 5 parts by weight of food grade lecithin, from about 5 to about 7 parts by weight of calcium carbonate, from about 10 to about 15 parts by weight of wine yeast, from about 20 to about 25 parts by weight of sodium citrate, and from about 60 to about 75 parts by weight of a palatable organic acid selected from malic acid, succinic acid, tartaric acid and citric acid, the weight ratio of dried granular product (i) to ingredients combination (ii) being from about 1:16 to about 1:7.

4,178,390

COMPOSITIONS FOR STABILIZING SOFT SERVE AND HARD FROZEN YOGURT

Robert S. Igoe, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1977, Ser. No. 860,342
Int. Cl.[2] A23C *9/12;* A23G *9/04*
U.S. Cl. 426—43 8 Claims

1. A stabilizer for use in soft serve or hard frozen yogurt which comprises by weight:

Propylene glycol alginate—45–60%
Sodium Alginate—15–35%
Guar—10–20%
Carrageenan—2–10%

4,178,391

PROCESS FOR IMPROVING THE FUNCTIONAL PROPERTIES OF PROTEIN MATERIAL

Kwei C. Chao, Naperville, Ill.; John A. Ridgway, Jr., LaPorte, Ind.; Philip G. Schnell, Wheaton, and Jacqueline H. Pearce, Lisle, both of Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 691,770, Jun. 1, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,458
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—61 23 Claims

1. A process for improving the functional properties of protein-containing materials comprising the steps of:

(a) preparing an aqueous slurry of a protein-containing material selected from the group consisting of (1) single-cell protein in the form of a cream, and (2) mixtures of single-cell protein cream with plant protein, whey solids, or both plant protein and whey solids, said mixtures containing from about 1 to about 99 weight percent of the single-cell protein component;

(b) heating the aqueous slurry to a temperature of from about 75° to about 100° C.;

(c) adjusting the pH of the heated slurry to within the range of about 6.6 to about 8.0 by adding a compound selected from the group consisting of anhydrous ammonia, ammonium hydroxide, calcium hydroxide, sodium hydroxide, sodium bicarbonate, calcium sulfate, potassium carbonate, potassium bicarbonate, calcium carbonate, sodium carbonate, potassium hydroxide, magnesium hyrdoxide and mixtures thereof;

(d) maintaining the heated, pH-adjusted slurry at said conditions for a time period of from about 1 to about 10 minutes; and

(e) drying the material from step (d).

21. A process for improving the functional properties of plant protein comprising the steps of:

(a) preparing an aqueous suspension of the plant protein;

(b) adjusting the pH of the solution to within the range of about 6.5 to about 7.5 by the addition of calcium carbonate, and calcium hydroxide;

(c) heating the aqueous solution to a temperature of from about 75° to about 100° C.;

(d) maintaining the solution at the abovesaid conditions for from about 30 to about 60 minutes; and

(e) drying the material from step (d).

4,178,392

METHOD OF MAKING A READY-TO-EAT BREAKFAST CEREAL

Harold C. Gobble, Johnstown Township, Barry County; Richard M. Vondell, Battle Creek, and Raymond Mooi, Wyoming, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed Jul. 1, 1977, Ser. No. 812,341
Int. Cl.[2] A23L *1/164*
U.S. Cl. 426—96 12 Claims

1. A method for making a ready-to-eat breakfast cereal product comprising the steps of first preparing a moldable, shape-retaining heterogeneous mixture comprising from about 20% to about 65% coarse particulate cereal components, sugar components in an amount sufficient to permit die molding of said mixture and from about 10% to about 35% moisture based on the total weight of the mixture, loosely compacting said mixture into a plurality of moist pieces on a cavity bearing roll, and then drying said pieces to a moisture content below 7% to produce a crisp, structure containing the particulate components adhered together by said sugar components.

4,178,393

METHOD OF PREPARING A MONOGLYCERIDE DOUGH ADDITIVE

Jens A. H. Gregersen, Skanderborg, Denmark, assignor to Aktieselskabet Grindstedvaerket, Arhus N, Denmark

Filed May 2, 1977, Ser. No. 792,612

Claims priority, application United Kingdom, May 3, 1976, 18022/76

Int. Cl.[2] **A21D** *2/16, 2/32*

U.S. Cl. 426—653 **9 Claims**

1. A method for preparing a pulverulent, free-flowing monoglyceride additive in the form of individual particles for use in the preparation of farinaceous and starch-containing edible products wherein the individual particles contain in substantially constant proportion (a) at least one monoglyceride and (b) at least one lecithin; comprising the steps of melting at least one distilled monoglyceride of saturated C_{12-24} fatty acids, adding at least one substantially dry lecithin in an amount so as to constitute 0.1–40% of the weight of the mixture and spray-cooling the resultant mixture substantially without adding water to obtain said individual particules.

4,178,394

PROCESS FOR PRODUCING SAUSAGE ANALOGS

Surinder Kumar, Buffalo Grove, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,535

Int. Cl.[2] **A23J** *3/00*

U.S. Cl. 426—656 **11 Claims**

1. A process for the production of a sausage analog resembling the natural product in appearance, cooking characteristics, flavor, eating qualities and texture, said process comprising:

a. providing an aqueous mixture of flavors, spices, and coloring agents;

b. forming a first phase by continuously mixing vital wheat gluten, water and salt into a dough, thereafter extruding the dough to obtain strands of hydrated gluten;

c. forming a second phase by mixing one part by weight textured protein concentrate with from 1–4 parts by weight of the aqueous mixture, and thereafter cutting the second phase to a desired size;

d. providing a third phase of an edible protein fiber;

e. forming a fourth phase by blending from 12–25 parts by weight egg white, from 7–10 parts by weight non-fat dry milk, from 3–4 parts by weight sodium caseinate and from 2–4 parts by weight dextrose with from 20–35 parts by weight fat which has been heated to a temperature in the range of 180°–220° F., thereafter, forming a gelatinous mass by adding from 30–40 parts by weight of the aqueous mixture which is at a temperature in the range of from 170° to 212° F.;

f. forming a fifth phase by blending one part by weight fat which is at a temperature in the range of 180°–220° F., with from 1–3 parts by weight of the aqueous mixture;

g. adjusting each phase to a temperature in the range of from 40°–60° F.; and

h. thereafter, thoroughly mixing all of the phases together, and forming patties or links, wherein, the amount of dough of the first phase is from about 10 to about 25 percent by weight of the final product.

4,178,395

METHODS FOR IMPROVING SOLAR CELL OPEN CIRCUIT VOLTAGE

John F. Jordan, and Vijay P. Singh, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Nov. 30, 1977, Ser. No. 855,887

Int. Cl.[2] **H01L** *31/18, 31/06*

U.S. Cl. 427—74 **8 Claims**

1. In a photovoltaic cell having a layer of polycrystalline CdS, a process for increasing the open circuit cell voltage, comprising the steps of:

exposing said layer of CdS to a sulfur-containing gas heated to a temperature range of 400°–600° C.

converting at least a portion of said layer of CdS to Cu_2S to obtain a photovoltaic heterojunction; and

applying a metallic positive electrode over at least a portion of said heterojunction, where said metallic electrode is selected from a group of materials effective to obtain an increased open circuit voltage from said photovoltaic cell.

4,178,396

METHOD OF FORMING AN INSULATING FILM

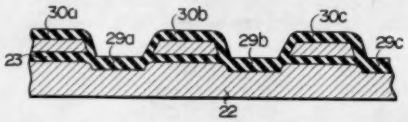
Haruo Okano; Nozomu Harada, and Nobuhisa Kubota, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 15, 1978, Ser. No. 933,844

Claims priority, application Japan, Aug. 30, 1977, 52-103192

Int. Cl.[2] **H01L** *21/312;* **C03C** *15/00, 25/06*

U.S. Cl. 427—93 **8 Claims**



1. A method of forming an insulating film on a polycrystalline substance layer which comprises the steps of preparing the polycrystalline substance layer; selectively removing the polycrystalline substance layer; heat-treating for the first time those portions of the polycrystalline substance layer which are left after said selective removal in an oxidizing atmosphere to provide an oxide layer; removing said oxide layer; and heat-treating for the second time the surface of the polycrystalline substance layer from which the preceding oxide layer was removed in an oxidizing atmosphere to form an insulating oxide film.

4,178,397

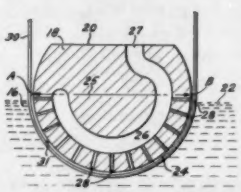
METHOD AND APPARATUS FOR TREATING ONE SIDE OF A STRIP

John B. Lovis, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 12, 1978, Ser. No. 924,113

Int. Cl.[2] **C23C** *1/02*

U.S. Cl. 427—300 **11 Claims**



1. A method of treating strip on one side comprising:

(a) providing a pressurized foil bearing with a lower curved surface extending a distance into a bath of liquid material,

(b) passing the strip into contact with the liquid material of said bath adjacent said foil bearing so that both sides of the strip are below the level of liquid material in said bath, and

(c) controlling the pressure of the pressurizing medium used within said foil bearing so as to support said strip on said foil bearing by a thin film of said pressurizing medium and to establish a curtain of pressurizing medium to prevent

said liquid material from passing between said curved surface and said strip and contacting the side of said strip adjacent said foil bearing while the other side of said strip is in contact with said liquid material.

4,178,398

AMIDOPHOSPHATE REACTION PRODUCTS USED AS FLAMEPROOFING AGENTS

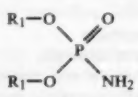
Hermann Nachbur, Dornach, and Peter Rohringer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 684,988, May 10, 1976, Pat. No. 4,094,929.
This application Mar. 23, 1978, Ser. No. 890,780
Claims priority, application Switzerland, May 15, 1975, 6264/75
Int. Cl.[2] C07F *9/24;* C09K *3/28*
U.S. Cl. 427—379 **12 Claims**

1. A process for the flameproofing of organic fiber materials, which process comprises applying to these fiber materials

(A) an amidophosphate reaction product which has been produced by reacting together at temperatures of 20° to 80° C. with or without acidic or basic catalysts

(1) 1 or 2 moles of an amidophosphate of the formula



wherein

R_1 is alkyl with 1 to 3 carbon atoms, alkenyl or halogenoalkyl with 2 or 3 carbon atoms or both R_1's together are alkylene with 2 to 5 carbon atoms,

(2) 1 mole of formaldehyde or an agent releasing formaldehyde,

(3) an aliphatic diol with 2 to 6 carbon atoms, and/or

(4) an alkanol with 1 to 3 carbon atoms, and

(B) optionally an aminoplast precondensate; drying the materials and then subjecting them to a treatment at elevated temperature above 100° C.

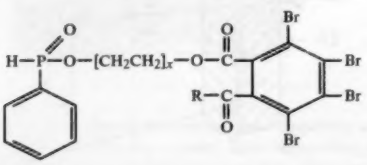
4,178,399

FLAME RETARDANT AND PROCESS

Seymour G. Hall, and Edward D. Mason, both of Greensboro, N.C., assignors to Chemonic Industries, Inc., Greensboro, N.C.

Filed Feb. 14, 1978, Ser. No. 877,578
Int. Cl.[2] B05D *3/02;* C07F *9/02*
U.S. Cl. 427—381 **3 Claims**

1. The process of flame retarding non-cellulosic fabrics comprising the steps of: raising the pH of a flame retardant containing the chemical compound:



where:

x=1-250, R is selected from the group: —H, —OH, —NH_3 or —COOH

by adding a water soluble basic compound to thereby increase the water solubility of said flame retardant, padding the fabric with said basic flame retardant solution, absorbing 2–10% dry flame retardant, removing the fabric from the flame retardant solution and fixing said flame retardant to the fabric.

4,178,400

AUTODEPOSITED COATINGS

Frank P. Lochel, Jr., Lansdale, Pa., assignor to Amchem Products, Inc., New York, N.Y.

Division of Ser. No. 755,921, Dec. 30, 1976, Pat. No. 4,108,817.
This application Jun. 8, 1978, Ser. No. 913,561
Int. Cl.[2] B05D *1/18;* C23F *7/00*
U.S. Cl. 427—435 **16 Claims**

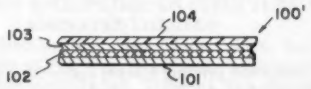
1. In a coating process wherein an autodeposited coating is formed on a metal surface by contacting said surface with an autodepositing composition and wherein the nature of said surface is such that coatings formed from said composition tend to have defects such as pinholes, blisters, craters or bridges, the improvement comprising contacting said surface with an autodepositing composition containing an acid inhibitor soluble in said composition in an amount sufficient to reduce or prevent the tendency of said composition to form coatings which have defects such as pinholes, blisters, craters or bridges, said amount being less than that amount which substantially deters or prevents said composition from forming an autodeposited coating or an autodeposited coating having the desired thickness.

4,178,401

PACKAGING FILM COMPRISING A BLENDED SELF-WELDING LAYER

Alan S. Weinberg, Greenville, and Joseph Z. Sun, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jan. 9, 1978, Ser. No. 868,158
Int. Cl.[2] B32B *27/08;* D03D *35/00;* A21D *10/02*
U.S. Cl. 428—35 **13 Claims**



1. A self-welding packaging film comprising:

(a) a self-welding layer comprising a blend of at least two copolymers of ethylene-vinyl acetate, each copolymer having a different melt flow, the melt flow of one copolymer being less than 5.0 and the melt flow of another copolymer being greater than 28.0;

(b) a substrate layer comprising a cross-linked, heat shrinkable polymeric material said polymeric material selected from the group consisting of polyethylene and ethylene-vinyl acetate copolymers; and,

(c) a layer having low gas permeability, the material for said layer being selected from the group consisting of:

(1) copolymers of vinylidene chloride;

(2) polyamides;

(3) polyesters;

(4) polyvinyl alcohol;

(5) acrylonitrile copolymers; and,

(6) hydrolized ethylene vinyl acetate copolymers; said substrate layer being located between the self-welding layer and the impermeable layer.

9. A multi-layer, self-welding packaging film comprising:

(a) a self-welding layer comprising a blend of two polymers,

(i) one polymer comprising the major portion of the blend and being selected from the group consisting of polyethylenes, ethylene-vinyl acetate copolymers, and ionomers having melt flows less than 5.0 and

(ii) the other polymer comprising a minor portion of the blend and being selected from the group consisting of ethylene-vinyl acetate copolymers and ethylene terpolymers having melt flows greater than 28.0; and,

(b) at least one additional film layer comprising a polymeric

material selected from the group consisting of polyethylenes, ethylene-vinyl acetate copolymers, hydrolyzed ethylene-vinyl acetate copolymers, polyvinyl alcohols, copolymers of vinylidene chloride and vinyl chloride, polyamides, and acrylonitrile copolymers, said additional layer being heat shrinkable.

4,178,402

CYLINDER BLANKET FOR OFFSET PRINTING PRESSES

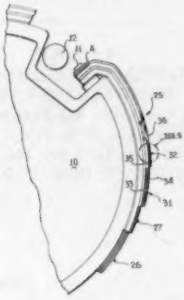
Friedrich Klapproth, deceased, late of Alsdorf, Fed. Rep. of Germany, and by Maria Elisabeth Klapproth, executrix, Uberheide 3, West, D 511 Alsdorf, Fed. Rep. of Germany

Continuation of Ser. No. 549,151, Feb. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 350,093, Apr. 11, 1973, abandoned. This application Feb. 2, 1978, Ser. No. 874,539

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1972, 2217796

Int. Cl.[2] **B32B** *3/02, 7/02*

U.S. Cl. 428—192 **13 Claims**



1. A composite printing blanket comprising at least a multi-ply printing blanket and a multi-ply supporting blanket, said multi-ply printing blanket being in overlying relationship to said multi-ply supporting blanket and being the outermost element relative to a printing cylinder to which said composite printing blanket is adapted to be attached, said multi-ply printing blanket and multi-ply supporting blanket each being constructed as a laminate of at least two individually, separately preformed sheets, an outermost sheet of said multi-ply printing blanket laminate being constructed of thin elastomeric material and being adapted to receive thereupon a fluid printing medium, an innermost sheet of said multi-ply printing blanket laminate being constructed of tear resistant relatively non-stretchable material, said two last-mentioned preformed sheets being immovably laminated relative to each other, an outermost sheet of said multi-ply supporting blanket laminate being disposed immediately adjacent to and against said innermost sheet of said multi-ply printing blanket laminate and being constructed of thick elastomeric material, an innermost sheet of said multi-ply supporting blanket laminate being constructed of tear resistant relatively non-stretchable material, said innermost and outermost preformed sheets of said multi-ply supporting blanket laminate being immovably laminated relative to each other, said outermost elastomeric sheet of said multi-ply printing blanket being thin as compared to said thick elastomeric outermost sheet of said multi-ply supporting blanket, said multi-ply supporting blanket being at least about five times as thick as said multi-ply printing blanket, said multi-ply printing blanket and multi-ply supporting blanket being in shifting relationship to each other whereby a foreign body impressed against said thin elastomeric outermost sheet of said multi-ply printing blanket laminate by the force of an associated printing cylinder creates limited localized deformation of said thin elastomeric outermost sheet which rapidly returns to a none-deformed state by virtue of the non-stretchable innermost sheet of said multi-ply printing blanket laminate, the thicker elastomeric outermost sheet of said multi-ply supporting blanket, and said shifting relationship between said multi-ply printing blanket and said multi-ply supporting blanket.

4,178,403

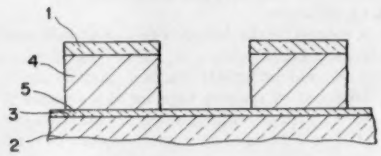
MASK BLANK AND MASK

Kunio Sakurai; Tsdashi Kojima, both of Hino, and Hiroshi Itoh, Tachikawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,777

Int. Cl.[2] **B32B** *15/04*

U.S. Cl. 428—209 **8 Claims**



1. A mask blank comprising

an optically transparent substrate,

an electrically conductive and transparent coating layer covering substantially the entire surface of said substrate and being made of material which is resistant to an etchant, said coating layer being formed by vacuum evaporation,

a chromium mask layer overlying said coating layer and formed by vacuum evaporation or sputtering, said mask layer being capable of being etched off by the etchant, and

an anti-reflection layer made of chromium oxide overlaying said mask layer.

4,178,404

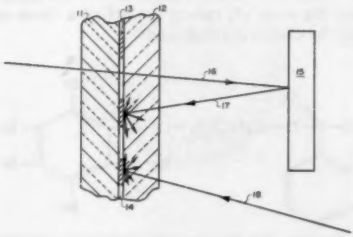
IMMERSED RETICLE

Edwin M. Allen; William C. Fitzgerald; Henry Blazek, and George Turner, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,062

Int. Cl.[2] **B32B** *15/04;* **B05D** *5/06;* **G02B** *1/10*

U.S. Cl. 428—209 **3 Claims**



1. A metallic reticle, comprising:

a transparent optical substrate;

a layer of titanium attached to said transparent optical substrate;

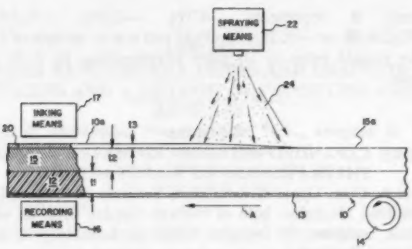
a layer of copper attached to said layer of titanium, said layer of copper having an oxidized surface characterized by fine feathery dendritic clusters.

4,178,405

MAGNETIC BELT WITH CONDUCTIVE COATING

Ami E. Berkowitz, Schenectady, N.Y., and Joseph A. Lahut, Waynesboro, Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,261
Int. Cl.[2] B32B 7/02; G11B 5/78
U.S. Cl. 428—215 7 Claims



1. A magnetic belt for use in a magnetic printer having means for magnetically recording information on said belt, comprising:

a backing layer having opposed first and second surfaces, said first surface being positioned adjacent to said magnetic recording means when said belt is in use;

a recording layer having first and second opposed surfaces and fabricated of ferromagnetic material, the first surface of said recording layer being in abutment with said second surface of said backing layer; and

a layer of conductive material, including carbon particles supported in a resin, fabricated upon said second surface of said recording layer furthest from said backing layer and providing said second surface of said recording layer with a surface resistivity of less than 10^9 ohms-per-square.

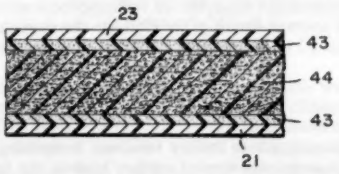
7. A magnetic belt as set forth in claim 1, wherein said backing layer has a thickness of about 0.8 milli-inches.

4,178,406

THREE-LAYERED FIBERGLASS CONSTRUCTION

Larry M. Russell, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 29, 1977, Ser. No. 865,567
Int. Cl.[2] B32B 5/16
U.S. Cl. 428—283 2 Claims



1. A performed fiberglass construction comprising a three-layered member having (a) a center layer comprising at least one layer of continuous strand fiberglass mat containing light-weight microspheres in the voids between the fibers of said continuous strand fiberglass mat, the microspheres and the fibers being bonded together by thermoplastic binder resin which is soluble in polymerizable liquid thermosettable resin mixture, between (b) a first outer layer and a second outer layer, each outer layer comprising at least one layer of chopped strand fiberglass mat containing thermoplastic binder resin which is soluble in polymerizable liquid thermosettable resin mixture.

4,178,407

ABSORBENT FIBROUS TOWEL

Harry E. Rubens, 14 Brookside Ct., East Brunswick, N.J. 08816

Continuation of Ser. No. 15,819, Mar. 2, 1970, abandoned, which is a continuation of Ser. No. 581,771, Sep. 23, 1966, abandoned. This application Jun. 28, 1974, Ser. No. 484,169
Int. Cl.[2] B32B 15/00
U.S. Cl. 428—284 2 Claims

1. An article of manufacture consisting of a thin compliant plastic sheet upon which is uniformly provided throughout on both sides thereof, an adhesive layer to which is adhered, a dry layer of soft, compliant, absorbent material having the absorbency of facial tissue with insufficient wet strength to permit handling when wet, said adhesive layer characterized by being flexible, thin, and insoluble when wet, and which will not strike through the absorbent material, nor change its appearance; said plastic sheet, adhesive and absorbent material, when assembled into the article of manufacture, having the softness and pliability of facial tissue, wherein the layer of compliant, absorbent material consists of loose fibers, each randomly attached to the adhering layer on the plastic sheet.

4,178,408

FLAME-PROOF EPOXY FIBROUS STRUCTURE AND LAMINATES THEREOF

Arnold Franz, Troisdorf-Spich, and Werner Stein, Troisdorf-Kriegsdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 740,501, Nov. 10, 1976, abandoned, which is a continuation of Ser. No. 442,938, Feb. 15, 1974, abandoned. This application Feb. 3, 1978, Ser. No. 874,966
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1973, 2308433
Int. Cl.[2] D04H 1/58; B32B 17/04
U.S. Cl. 428—285 23 Claims

1. A fibrous structure consisting essentially of a cellulosic or glass fibrous substrate impregnated and imbibed with an epoxide resin and liquid pentabromodiphenyl ether, said pentabromodiphenyl ether being present in an amount of 5 to 30 percent by weight based upon the weight of said epoxide resin, said fibrous structure having a bending strength, determined after three days at 200° C. in accordance with Deutsche Industrie Norm 7735 of at least 1,000 kp/cm^2, said structure having a flamability rating according to Underwriters' Laboratory Test 492 of no greater than 1.

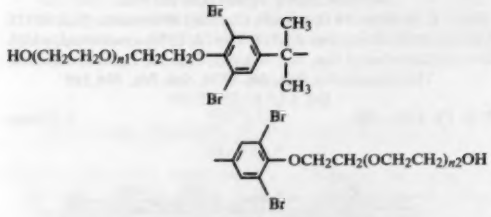
4,178,409

FLAME RETARDANT COATING COMPOSITION AND FABRIC COATED THEREWITH

Mikio Tomita, Kyoto, Japan, assignor to Meisei Chemical Works, Inc., Kyoto, Japan

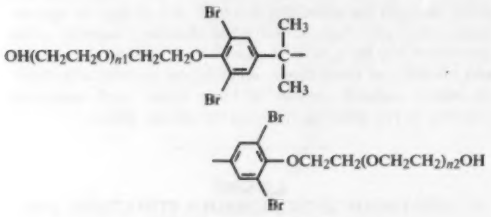
Filed Aug. 12, 1977, Ser. No. 824,020
Claims priority, application Japan, Aug. 25, 1976, 51-101962; Jun. 15, 1977, 52-71847
Int. Cl.[2] C08G 18/32; B32B 27/18; C08K 5/06
U.S. Cl. 428—290 7 Claims

1. A flame retardant coating composition which consists essentially of a hydroxyl-terminated thermoplastic polyurethane and the additive 2,2-bis(4-hydroxy-3,5-dibromophenyl)-propane derivative having the following general formula



wherein each n1 and n2 represents zero or a positive integer and n1+n2 is zero or one of the positive integers from 1 to 8, in the weight ratio of 20 parts polyurethane to 3–30 parts of said propane derivative.

4. A coated fabric which is obtained by applying to a fabric a coating composition containing an organic solvent solution of a hydroxyl-terminated thermoplastic polyurethane admixed with a 2,2-bis(4-hydroxy-3,5-dibromophenyl)propane derivative having the following general formula



wherein each n1 and n2 represents zero or a positive integer and n1+n2 is zero or one of the positive integers from 1 to 8, in the weight ratio of 20 parts polyurethane to 3–30 parts of said propane derivative.

4,178,410

FLAME RETARDANT COATING COMPOSITION AND FABRIC COATED THEREWITH

Mikio Tomita, Kyoto, Japan, assignor to Meisei Chemical Works, Inc., Kyoto, Japan

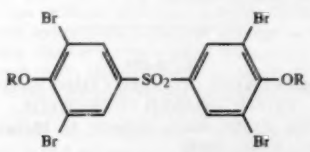
Filed Aug. 22, 1977, Ser. No. 826,486

Claims priority, application Japan, May 17, 1977, 5_-57330; Jun. 15, 1977, 52-71848

Int. Cl.[2] C08G *18/32;* **B32B** *27/18;* **C08K** *5/41*

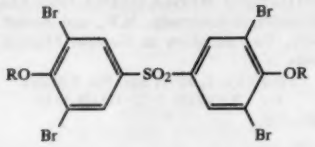
U.S. Cl. 428—290 **7 Claims**

1. A flame retardant coating composition which consists essentially of a hydroxyl-terminated thermoplastic polyurethane and a sulfone additive having the general formula



wherein R represents —H, —CH_3, —C_2H_5, —C_3H_7OH, —CH_2CH_2Br, or —$(CH_2CH_2O)_nH$ and n is an integer of 1 to 5, in the weight ratio of 20 parts polyurethane to 3–30 parts sulfone.

4. A coated fabric which is obtained by applying to a fabric a coating composition containing an organic solvent solution of a hydroxyl-terminated thermoplastic polyurethane admixed with a sulfone having the following general formula



wherein R represents —CH_3, —C_2H_5, —C_3H_7OH, —CH_2CH_2Br or —$(CH_2CH_2O)_nH$ and n is an integer of 1 to 5, in the weight ratio of 20 parts polyurethane to 3–30 parts sulfone.

4,178,411

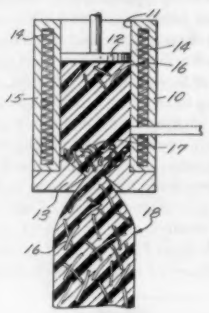
FIBRE EXPANDED REINFORCED MATERIALS AND THEIR PROCESS OF MANUFACTURE

Ernest A. Cole, Upper Gravenhurst; Frederic N. Cogswell, and Jonathan Huxtable, both of Welwyn Garden City, all of England, assignors to Imperial Chemical Industries, Limited, London, England

Filed Jul. 11, 1977, Ser. No. 814,670

Int. Cl.[2] B29D *27/00*

U.S. Cl. 428—310 **16 Claims**



1. A method for producing a low density material comprising extruding a composition comprising a settable fluid containing resilient fibres through a die generally having a minimal land length so that relaxation of the fibres causes the extrudate to expand to form an open fibrous structure as it leaves the die, wherein the settable fluid used when resinous is selected from those having a melt viscosity of between 10 Ns/m^2 and 10,000 Ns/m^2 measured at a shear rate of 100 reciprocal seconds and the ratio of average length of the fibres to the diameter of the die is at least 2.5 to 1, and then causing or allowing the fluid to set.

12. A low density structure comprising a fibre expanded material in the form of a shaped article produced according to the method of claim 1.

13. A composite low density structure comprising a fibre expanded material and bonded surface layer in the form of a shaped article produced according to the method of claim 6.

4,178,412

GLASS SIZE COMPOSITIONS AND GLASS FIBERS COATED THEREWITH

Donald B. Sage, Granville, and Fred G. Krautz, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 752,222, Nov. 20, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,883

Int. Cl.[2] B32B *9/00;* **D02G** *3/00*

U.S. Cl. 428—391 **8 Claims**

1. A glass fiber having a portion of its surface coated with

about 1.2 to 3.0 weight percent of a sizing composition, said sizing composition comprising:

(a) an unsaturated water-emulsifiable polyester resin;

(b) an emulsion of a copolymer of ethylene and vinyl acetate; and

(c) a copolymer of polyvinylacetate and an organo silane having about 1 to 7 weight percent of said organo silane.

4,178,413

FIBER REINFORCED CARBON AND GRAPHITE ARTICLES AND A METHOD OF PRODUCING SAID ARTICLES

Gabriel P. DeMunda, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,702

Int. Cl.[2] B32B *9/00*

U.S. Cl. 428—408 **17 Claims**

1. A fiber reinforced article composed of a matrix of fibrous carbon material bonded together by a deposited pyrolytic material and having the residue of a carbonizable filler material deposited on said pyrolytic material, said residue produced by initially depositing and subsequently carbonizing said carbonizable filler material on said pyrolytic material.

4,178,414

METHOD OF TOUGHENING GLASS SHEETS

Geoffrey Greenhalgh, Orrell, near Wigan, England, assignor to Triplex Safety Glass Company Limited, Birmingham, England

Filed Jun. 19, 1978, Ser. No. 916,557

Claims priority, application United Kingdom, Jun. 23, 1977, 26360/77

Int. Cl.[2] C03B *27/00*

U.S. Cl. 428—410 **15 Claims**

1. A method of toughening a glass sheet comprising: advancing the glass sheet into and relative to a flow of quenching gas directed towards at least one surface of the glass sheet from individual gas outlets to induce overall toughening stresses therein, differentially toughening the glass sheet by terminating advance of the sheet relative to the flow of quenching gas for a predetermined time, whereby localised gas flows are applied to at least said one surface of the glass sheet from said individual gas outlets during said predetermined time to produce in the glass as the toughening stresses develop a distribution of regions of more highly toughened glass interspersed with regions of lesser toughened glass, in which distribution there are areas in which there are major and minor principal stresses acting in the plane of the glass sheet, and continuing the advance of the glass sheet relative to the flow of quenching gas after said predetermined time.

4,178,415

MODIFIED AMORPHOUS SEMICONDUCTORS AND METHOD OF MAKING THE SAME

Stanford R. Ovshinsky, Bloomfield Hills, and Krishna Sapru, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 22, 1978, Ser. No. 888,915

Int. Cl.[2] H01B *1/02*

U.S. Cl. 428—446 **21 Claims**

1. The method of making an amorphous semiconductor device comprising depositing on a substrate an amorphous semiconductor film including an amorphous semiconductor host matrix comprising silicon and oxygen and a modifier material comprising an alkali metal incorporated therein by codeposition of the same, and controlling the amounts of silicon and oxygen in the amorphous host matrix, wherein the silicon to oxygen ratio is represented by SiO_x where x can be controlled from above 0 to 2, and the amount of alkali metal incorporated therein for controlling the energy gap and the room temperature electrical conductivity of the device.

4,178,416

ACICULAR FERRIC OXIDE FOR MAGNETIC RECORDING AND PROCESS FOR PRODUCING SAME

Jean-Marie H. Hector, Ozoir-La-Ferriere, and Bernard J. Pingaud, Vincennes, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 775,146, Mar. 7, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,135

Claims priority, application France, Mar. 12, 1976, 76 07074

Int. Cl.[2] C01G *49/06*

U.S. Cl. 428—539 **12 Claims**

1. A process for preparing cobalt doped, acicular, gamma ferric oxide crystals that exhibit improved print-through without substantial loss in signal output or recording sensitivity which process comprises:

(1) forming an aqueous dispersion of ferrous hydroxide particles by adding an aqueous solution of ferrous salt having a pH up to about 5.5 to an aqueous solution of a stoichiometric excess of an alkaline hydroxide, in the presence of cobalt doping ions, while substantially avoiding local excesses of said ferrous salt,

(2) introducing oxygen into said dispersion at a temperature below 60° C. for a period of time sufficient to convert said ferrous hydroxide particles to ferric oxide hydrate crystals, and,

(3) subjecting said crystals to dehydration, reduction and oxidation to form cobalt doped, acicular, gamma ferric oxide, said process being characterized by the addition of about 0.5 to 20 percent, by weight, based on ferrous hydroxide, of a water soluble acyclic dicarboxylic acid or its precursor prior to said introduction of oxygen.

10. Cobalt doped, acicular, gamma ferric oxide crystals that exhibit improved print-through without substantial loss in signal output or recording sensitivity, said crystals being formed according to the process of claim **1** by cobalt doping in the presence of a water soluble, acyclic, dicarboxylic acid which directs cobalt ions into substitution sites within the crystal lattices, said crystals exhibiting an increase of at least 5 percent in the ratios between the intensities of each of the triplet lines 110, 210, 211, with respect to the 111 line, as determined by X-ray diffraction, in comparison to corresponding crystals prepared according to the process of claim **3** but, in the absence of said acid.

4,178,417

CLAD STEEL

Toyohisa Oda, and Kinichi Inouye, both of Funabashi, Japan, assignors to The Japan Steel Works, Ltd., Tokyo and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 780,276, Mar. 23, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 876,902

Int. Cl.[2] B32B *15/18*

U.S. Cl. 428—679 **4 Claims**

1. A clad steel in which a base metal of extremely low carbon steel is bonded together with an austenite stainless steel, nickel or nickel alloy as a cladding metal by hot rolling, wherein in order to prevent diffusion of carbon contained in the base metal into the cladding metal due to a heat cycle subjected to during or after the manufacturing of the clad steel, the base metal contains 0.010 to 0.030 wt. % of carbon with Ti and/or Zr added as carbon fixing elements in such an amount that a Ti-equivalent is given by the following formula:

$$\text{Ti-equivalent (wt \%)} = Ti \text{ (wt \%)} + [Zr \text{ (wt \%)}/1.5]$$

wherein, Ti (wt %) and Zr (wt %) representing the amounts of Ti and Zr, respectively in wt %; is 0.15 to 0.55 wt % and yet the ratio of the Ti-equivalent to the carbon content is 12:1 to 30:1, and during said hot rolling of the clad steel a 15 to 40% reduction ratio is adopted per pass, and directly after the hot rolling the clad steel is water cooled, said base metal thereby having a grain size number larger than No. 8.

4,178,418

GALVANIC CELL FOR THE ELECTROCHEMICAL PRODUCTION OR STORAGE OF ELECTRICAL ENERGY

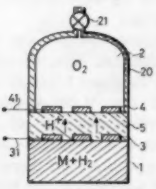
Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson - CSF, Paris, France

Filed May 3, 1978, Ser. No. 902,760

Claims priority, application France, May 4, 1977, 77 13513

Int. Cl.[2] H01M *12/04*

U.S. Cl. 429—27 **4 Claims**



1. A galvanic cell of the kind in which an electrochemical reaction employing at least one ionisable species is used to produce electrical energy from chemical energy or to transform electrical energy into chemical energy, comprising:

(a) a first solid non-porous body belonging to the group of metals and metal hydrides capable of storing an ionisable species having a high coefficient of diffusion within said body;

(b) a first electrode constituted by a grid of catalytic material positioned on one side of the first non-porous body;

(c) a polycrystalline ceramic deposited on the first body through and over said grid according to the technology of thin-film deposition, constituting a layer so thin as to exhibit a low ohmic resistance to the current of the ion produced by said ionisable species and a relatively high ohmic resistance to the electronic current; and

(d) a second electrode constituted by a grid of catalytic material disposed on top of the polycrystalline ceramic for promoting the reduction of ionizable species.

4,178,419

PROCESS AND PRODUCT

Wesley Memeger, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1978, Ser. No. 881,731

Int. Cl.[2] C08J *9/02*

U.S. Cl. 521—89 **7 Claims**

1. Process for preparing an aromatic polyamide foam having a density of 0.025 to 0.7 g./cm^3 by heating a mixture of an N,N'-dialkyl aromatic polyamide having at least one β hydrogen atom on the alkyl groups and a plasticizer at a temperature of 250° to 340° C. for a time sufficient to remove substantially all of the N-alkyl groups wherein the mixture contains an aromatic sulfonic acid as catalyst.

4,178,420

AMINE ANTIOXIDANTS AS ANTISCORCH AGENTS IN FLAME RETARDED POLYURETHANE FOAMS

Michael J. Reale, Brewster, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 21, 1978, Ser. No. 926,678

Int. Cl.[2] C08K *5/52*

U.S. Cl. 521—107 **12 Claims**

1. A flame retardant polyurethane foam comprising a low density polyurethane foam, a flame retardant amount of a flame retardant comprised of a poly(haloethyl-ethyleneoxy)-phosphoric acid ester and from about 0.25 percent to about 5.0 percent by weight of said flame retardant of an amine antioxidant.

4,178,421

METHOD FOR DISPERSING AN ADDITIVE INTO A THERMOPLASTIC RESIN

Donald F. Thompson, Elburn; Joseph M. Mizenko, Naperville, both of Ill., and Elmer Sivak, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,907

Int. Cl.[2] C08K *5/09*

U.S. Cl. 525—4 **15 Claims**

1. A process for dispersing a nucleating agent into a thermoplastic resin comprising (1) thoroughly mixing an aqueous solution of the nucleating agent into a powder of the thermoplastic resin to form a superficially dry powder blend; (2) without prior drying applying sufficient heat and shear to such powder blend to rapidly volatilize water and to form a molten flux of the thermoplastic resin; and (3) recovering the thermoplastic resin with the nucleating dispersed therein.

4,178,422

ETHYLSULFONATE-ALKYLAMINE COPOLYMERS AS COLORANT BACKBONES

Kenneth M. Otteson, San Carlos, and Daniel J. Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation-in-part of Ser. No. 638,731, Dec. 8, 1975, Pat. No. 4,096,134. This application Apr. 19, 1978, Ser. No. 897,812

The portion of the term of this patent subsequent to Jan. 20, 1995, has been disclaimed.

Int. Cl.[2] C08F *28/00;* **C08G** *75/00*

U.S. Cl. 525—336 **12 Claims**

1. A copolymer comprising a plurality of ethylsulfonate and 2 to 6 carbon atom lower alkylamine groups, the sum of the number of ethylsulfonate groups and lower alkylamine groups being from 20 to 8000 and the number of lower alkylamine groups being from 0.4 to 2.5 times the number of ethylsulfonate groups.

4,178,423
INTERNALLY STABILIZED VINYL CHLORIDE POLYMERS COMPRISING CALCIUM AND ZINC ACRYLATES

Donald F. Anderson, White Plains, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 839,855, Oct. 6, 1977, Pat. No. 4,146,698. This application Sep. 14, 1978, Ser. No. 942,251
Int. Cl.² C08F *30/04, 230/04*
U.S. Cl. 526—240 **12 Claims**

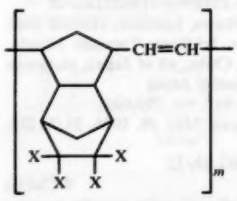
1. A polymer product having improved thermal stability which comprises a polymer of vinyl chloride, or vinyl chloride and up to 50%, by weight, of a monoethylenically unsaturated comonomer, and up to about 10%, by weight of the vinyl chloride or vinyl chloride and comonomer, of a mixture of calcium and zinc acrylate.

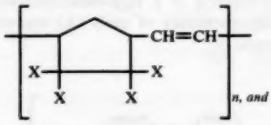
4,178,424
CYCLOOLEFIN COPOLYMERS

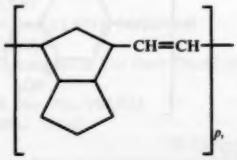
Linwood P. Tenney, Hudson, and Parley C. Lane, Jr., Cuyahoga Falls, both of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 857,141, Dec. 5, 1977, Pat. No. 4,136,247. This application Dec. 29, 1978, Ser. No. 974,650
Int. Cl.² C08F *32/08, 232/08*
U.S. Cl. 526—283 **5 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units of (1) about 5 to about 80 wt.% of tetracyclododecene, at least one alkyltetracyclododecene wherein each alkyl group contains from 1 to about 8 carbon atoms, or a mixture thereof, (2) about 10 to about 80 wt.% of norbornene, at least one alkylnorbornene wherein each alkyl group contains from 1 to about 8 carbon atoms, or a mixture thereof, (3) about 5 to about 80 wt.% of dicyclopentadiene, and (4) a minor amount of at least one acyclic monoolefin or nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atom, all of said weight percentages being based upon total copolymer weight, and said copolymer containing groups of the following types, where m, n and p are numbers which are proportional to the concentrations of tetracyclododecene/alkyltetracyclododecene, norbornene/alkylnorbornene, and dicyclopentadiene respectively, and any X is hydrogen or an alkyl group containing from 1 to about 8 carbon atoms:







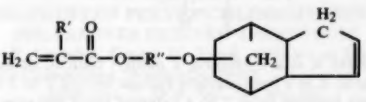
wherein the ring double bond in the last formula above can be in either position shown.

4,178,425
POLYURETHANE COATING COMPOSITIONS CONTAINING UNSATURATED ESTERS OF GLYCOL MONODICYCLOPENTENYL ETHERS

William D. Emmons, Huntingdon Valley, and Kayson Nyi, Sellersville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 703,348, Jul. 7, 1976, Pat. No. 4,097,677. This application May 22, 1978, Ser. No. 908,415
Int. Cl.² C08G *18/22, 18/30;* C08L *27/00, 75/04*
U.S. Cl. 528—73 **12 Claims**

1. A composition having a film-forming binder comprising:
(1) A member selected from the group consisting of an organic polyisocyanate, a urethane oil, and a uralkyd;
(2) at least one non-volatile reactive liquid monomer having the general formula



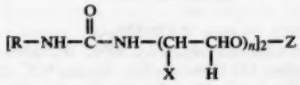
wherein R' is H or CH_3 and R" is selected from the group consisting of:
(a) Alkylene groups having 2 to 6 carbon atoms and
(b) Oxyalkylene groups having at least 4 to 12 carbon atoms and having at least one oxygen atom joining distinct segments of the alkylene group, each segment having at least 2 carbon atoms; and
(3) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the curing of (1) and (2), component (2) being 5 to 95% by weight of the binder.

4,178,426
EPOXY RESIN COMPOSITIONS

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,500
Int. Cl.² C08G *59/56, 59/60*
U.S. Cl. 528—111 **12 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:
a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;
a curing amount of a polyamine curing agent comprising 3-aminopropyl ethylenediamine or bis-(3-aminopropyl) ethylenediamine; and,
an effective amount of an additive consisting essentially of a polyether diureide having terminal ureido or mono substituted ureido groups said diureide having the formula:



wherein R is hydrogen, or a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms, or a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms; or, a branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; X is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms and n is a number selected such that the molecule of the above formula has a molecular weight of from about 2000 to about 3000.

4,178,427

POLYETHER UREA EPOXY CURING AGENT

Harold G. Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 683,359, May 5, 1976, abandoned, which is a division of Ser. No. 555,844, Mar. 6, 1975, Pat. No. 4,002,598. This application Feb. 6, 1978, Ser. No. 875,473

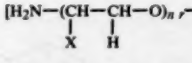
Int. Cl.[2] C08G *59/50*

U.S. Cl. 528—124 **23 Claims**

1. A curable epoxy resin composition consisting essentially of:

a vicinal polyepoxide; and,

an effective amount of a polyether urea curing agent having terminal primary amino groups and being formed by the reaction of a compound selected from a group consisting of bifunctional isocyanates obtained by phosgenation of an aniline formaldehyde condensation product with a polyoxyalkylenepolyamine of the formula:



wherein X is a hydrogen, a methyl radical, or an ethyl radical; Z is a hydrocarbon radical having 2 to 5 carbon atoms forming from 2 to 4 external ether linkages, n is a number from 1 to about 15, and r is a number from 2 to 4 wherein the molar ratio of said isocyanate compound to said polyoxyalkylenepolyamine is from 0.25 to 0.50.

4,178,428

THERMALLY STABLE ENYNE POLYSULFONE POLYMERS

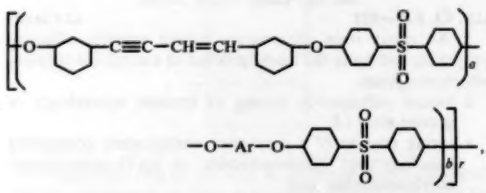
Fred E. Arnold, Centerville, and Bruce A. Reinhardt, New Carlisle, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,291

Int. Cl.[2] C08G *75/23*

U.S. Cl. 528—174 **9 Claims**

1. An enyne polysulfone consisting of essentially repeating units having the following structural formula:



wherein Ar is a divalent aromatic radical; a is equal to 0.05 to 1, b is equal to zero to 0.95, and the sum of a and b is equal to 1; and n is an integer ranging from about 1 to 100.

4,178,429

CATALYST FOR CURING RESINS

Karl D. Scheffer, 121 Governor Dr., Scotia, N.Y. 12302

Filed Nov. 17, 1978, Ser. No. 961,666

Int. Cl.[2] C08G *2/30, 4/00*

U.S. Cl. 525—398 **31 Claims**

1. A resin curing catalyst comprising an aqueous solution of perchloric acid in a concentration of about 45 to about 72% based on weight.

8. A process of curing an acid catalyzed curing resin which comprises admixing said resin with an aqueous solution of perchloric acid containing about 45 to about 72% by weight of acid.

15. A process according to claim 8 wherein sand is added and said resin is a furan and said aqueous solution is employed at a level in the range of about 4 to about 10% by weight based on resin.

4,178,430

POLYMERIC SCHIFF'S BASES CONTAINING ACETYLENE TERMINAL GROUPS

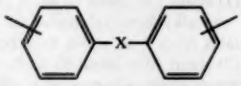
Norman Bilow, Encino, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 20, 1978, Ser. No. 962,573

Int. Cl.[2] C08G *12/08, 12/40*

U.S. Cl. 528—245 **6 Claims**

1. A polymerizable acetylene terminated Schiff's base oligomer whose formula is HC≡C—Ar—R—AR—C≡CH where R may be —N=CH—Ar'—CH=N— or —CH=N—Ar'—N=CH—, Ar is phenylene, biphenylene, naphthylene, anthracene, phenanthrene, pyrene, alkyl and aryl substituted phenylene, alkyl or aryl substituted naphthylene, heterocyclic analogues of the above and wherein one or more of the aromatic carbon atoms is replaced by nitrogen, heterocyclic analogues of the above wherein one or more of the aromatic carbon atoms is replaced by sulfur or a moiety whose structure is



where X is O, S, CH_2, $—CH_2—_n$, —CO—, $—CF_2—_n$, $>C(CH_3)_2$, $—SO_2—$ or phenylene and Ar' is phenylene, diphenylene, terphenylene, naphthalene, anthracene, phenanthrene or a compound whose structure is $\phi—X'—\phi$ wherein ϕ is phenylene and X' is O, S, CH_2, $—CH_2—_n$, —CO—, $—CF_2—_n$, $>C(CH_3)_2$ or $—SO_2—$.

4,178,431

AROMATIC COPOLYAMIDE FIBER FROM BENZIDINE SULFONE OR DIAMINO PHENANTHRIDONE

Takaho Kaneda, Chiba; Seiji Ishikawa, Ichihara; Hiroshi Daimon, Ichihara; Toshio Katsura, Ichihara; Tatsuaki Maeda, Ichihara, and Tadahiro Hondo, Chiba, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

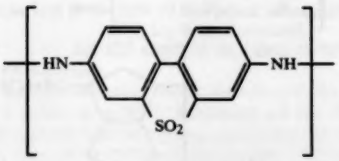
Filed May 20, 1977, Ser. No. 799,091

Claims priority, application Japan, May 28, 1976, 51/61234; Feb. 8, 1977, 52/12066

Int. Cl.[2] C08G *69/32*

U.S. Cl. 528—337 **8 Claims**

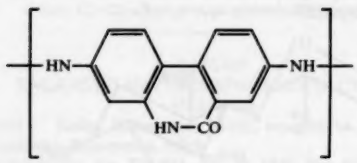
1. A fiber composed of a high-molecular-weight copolyamide consisting essentially of units (A) represented by the following formula:



(A-1)

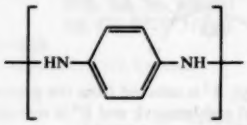
or

(A-2)



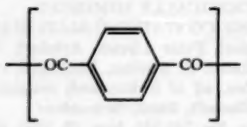
units (B) represented by the following formula:

(B)



and units (C) represented by the following formula:

(C)



in which the units (A), (B) and (C) are present in such amounts that the sum of amounts of units (A) and (B) is substantially equimolar to the amount of the units (C) and the molar ratio of the units (A) to the units (B) is in the range of from 10/90 to 50/50, said fiber having an initial modulus of elasticity of from 400 to 1,085 g/d and a tensile strength of from 16 to 44.1 g/d.

4,178,432

COPOLYOXALAMIDE FROM BRANCHED CHAIN DIAMINE

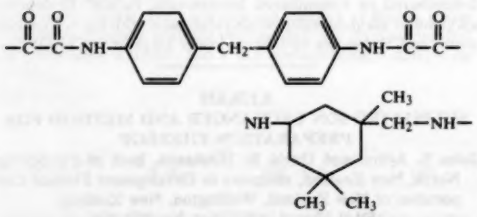
Augustin T. Chen, Cheshire, and Kemal B. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 824,645, Aug. 15, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 928,206

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—340 **7 Claims**

6. A thermoplastic copolyoxalamide consisting essentially of the recurring unit



4,178,433

PROCESS FOR MAKING ARYLENE SULFIDE POLYMERS

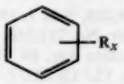
Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1978, Ser. No. 904,834

Int. Cl.[2] C08G *75/00*

U.S. Cl. 528—381 **10 Claims**

1. A process for making an arylene monosulfide polymer which comprises heating a mixture of a benzenoid arylene compound having 1–3 benzene rings in the molecule and having the structural formula



wherein x is 0–2 and each R is halogen, lower alkyl, lower alkoxy, phenyl, phenoxy, biphenyl, biphenoxy, or a phenyl, biphenyl, phenoxy, or biphenoxy radical having a halogen, lower alkyl, or lower alkoxy substituent with about one mole of a sulfur halide which is S_2Cl_2 or S_2Br_2 per mole of arylene compound at a temperature of about 90° C.–350° C. in the presence of a metal halide Friedel-Crafts catalyst and recovering from the heated mixture a polyarylene sulfide resin essentially free of disulfide linkages.

4,178,434

AMINE-COUPLED POLYEPICHLOROHYDRIN AND POLYAMINES DERIVED THEREFROM

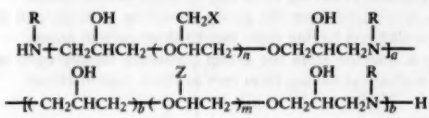
William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 3, 1978, Ser. No. 866,207

Int. Cl.[2] C08G *65/32, 65/26*

U.S. Cl. 528—405 **13 Claims**

1. A substantially linear polyamine, corresponding to the formula:



wherein R is either C_1 to C_4 alkyl group, 2-hydroxyethyl—or 2-hydroxypropyl, X is halogen, Z is either hydrogen, methyl or ethyl, n is a whole number ranging from 2 to 30, m is an integer from 2 to about 100, a is a value from about 0 to about 20, b is a value from about 0 to 20, the polyamine comprising the reaction product of (a) an epihalohydrin oligomer or a mixture of an epihalohydrin oligomer and a halohydrin-terminated derivative of a polyol and (b) a primary amine.

4,178,435

RECOVERY PROCESS FOR BRANCHED POLYPHENYLENE

Liong S. Tee, Naperville, Ill., and John C. Reindl, Troy, Mich., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 752,516, Dec. 20, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,400

Int. Cl.[2] C08G *61/10*

U.S. Cl. 528—501 **4 Claims**

1. A process for separating branched polyphenylene from a polymerization reaction mixture comprising branched polyphenylene formed by a metal oxide catalyst, hydrogen and unreacted monomer comprising the steps (a) discharging said reaction mixture from a polymerization reactor held at a pressure above about 1000 psig and at a temperature above about 400° C. into a first devolatilizing chamber maintained at a pressure below about 300 psig and at a temperature between about 300° and 600° C.; (b) after a time sufficient to remove a majority of unreacted monomer, removing volatile components from such first devolatilizing chamber; (c) transferring the remaining non-volatile components to a second devolatilizing chamber maintained at a pressure below atmospheric and at a temperature between about 400° and 500° C. for about 30 minutes; and (d) recovering the branched polyphenylene from such second devolatilizing chamber.

4,178,436

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C_8 MODIFICATIONS

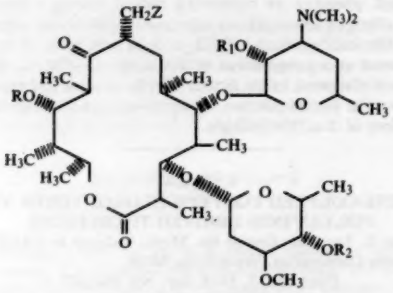
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 5, 1976, Pat. No. 4,036,853. This application Apr. 10, 1978, Ser. No. 894,997

Int. Cl.² C07H *17/08*

U.S. Cl. 536—9 **5 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and *n*-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and *n*-alkanoyl having from two to three carbon atoms;

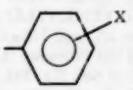
R_2 is selected from the group consisting of hydrogen and *n*-alkanoyl having from two to three carbon atoms;

Z is—NHR_5;

R_5 is

and

R_6 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, amino (—NH_2), alkylamino having from one to six carbon atoms, pyridyl, anilino, α-thienyl, and



said substituent X being selected from the group consisting of hydrogen, halogen, alkyl having from one to four carbon atoms, alkoxycarbonyl having from one to four carbon atoms in the alkoxy group, CF_3, alkyloxy having from one to four carbon atoms, $CONH_2$ and —NO_2.

4,178,437

1-N-KANAMYCIN DERIVATIVES

Michael B. Thomas, Deal, England, assignor to Pfizer Inc., New York, N.Y.

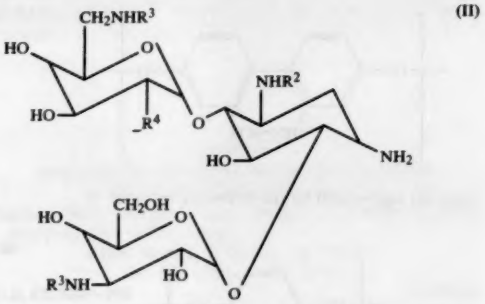
Filed Jul. 14, 1978, Ser. No. 924,515

Claims priority, application United Kingdom, Aug. 18, 1977, 34808/77

Int. Cl.² A61K *31/71;* C07H *15/22*

U.S. Cl. 536—10 **4 Claims**

1. A compound of the formula:



(II)

wherein R^2 is formyl; R^3 is selected from the group consisting of C_2 to C_4 alkanoyl and benzoyl; and R^4 is selected from the group consisting of hydroxy and NHR^3.

4,178,438

CATIONICALLY MODIFIED, CELLULOSE-CONTAINING MATERIALS

Jaroslav Haase, Basel; Peter Liechti, Arisdorf; Hans Wegmüller, Riehen; Rudolf F. Wurster, Pfeffingen, and Quentin Bowes, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

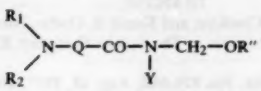
Continuation of Ser. No. 740,586, Nov. 10, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,823

Claims priority, application Switzerland, Nov. 14, 1975, 14798/75

Int. Cl.² B01D *39/00;* C08B *15/06*

U.S. Cl. 536—30 **11 Claims**

1. Cationically modified cellulose material which contains at least 0.4% by weight of basic nitrogen and has a cationic constituent derived from a basic amide compound of the formula



(4)

wherein R″ represents hydrogen or C_1–C_4-alkyl, R_1 and R_2 independently of one another represent hydrogen, lower alkyl which is unsubstituted or substituted by halogen, hydroxyl, lower alkoxy or cyano, or cycloalkyl or benzyl, or R_1 and R_2, together with the nitrogen atom which links them, denote a 5-membered or 6-membered heterocyclic radical, Q denotes alkylene or alkyl-substituted alkylene each with up to 8 carbon atoms and Y denotes hydrogen, lower alkyl or —CH_2OR''—.

4,178,439

SULPHATED ION EXCHANGER AND METHOD FOR PREPARATION THEREOF

John S. Ayers, and David R. Husbands, both of Palmerston North, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Mar. 1, 1977, Ser. No. 773,269

Claims priority, application New Zealand, Mar. 4, 1976, 180198

Int. Cl.² C08B *5/14, 7/00, 37/02, 37/04*

U.S. Cl. 536—59 **16 Claims**

1. A cationic ion exchanger comprising a water insoluble hydrophilic, water swellable matrix;

a plurality of sulphate groups chemically bonded to said matrix, the ion exchange capacity of said exchanger being provided by said sulphate groups; said matrix being a member selected from the group consisting of:

(a) a cross-linked carbohydrate, and,

(b) a cross-linked carbohydrate having a plurality of hydroxy C_a–C_4 alkyl groups chemically bonded thereto.

4,178,440

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

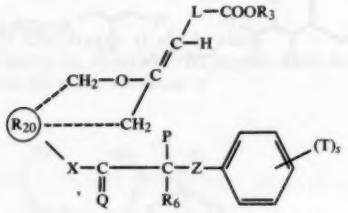
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,291

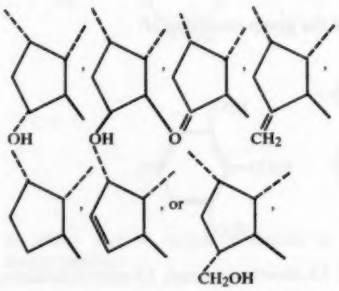
Int. Cl.[2] **C07D** *311/02*

U.S. Cl. 542—426 **24 Claims**

1. A 5Z compound of the formula



wherein is



wherein L is

(1) $-(CH_2)_d-C(R_2)_2-$

(2) $-CH_2-O-CH_2-Y-$ or

(3) $-CH_2CH=CH-$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,

wherein Q is

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, or (c) a pharmacologically acceptable cation;

wherein R_5 and R_6 are hydrogen. alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two R's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and

wherein x is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C— or

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,178,441

ENLARGED-HETERO-RING PROSTACYLIN ANALOGS

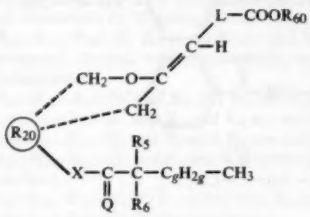
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,296

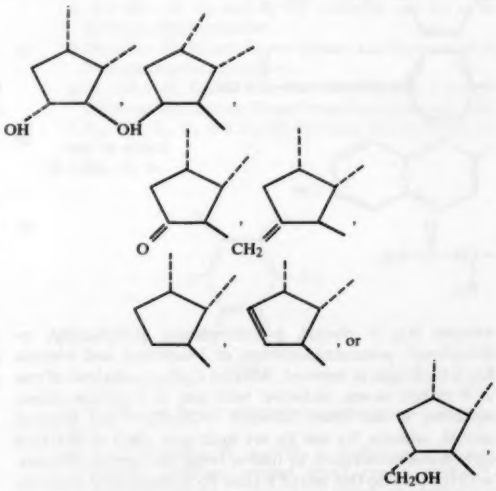
Int. Cl.[2] **C07D** *311/02*

U.S. Cl. 542—426 **17 Claims**

1. A 5Z compound of the formula



wherein R_{20} is



wherein

L is

(1) $-(CH_2)_d-C(R_2)_2-$

(2) $-CH_2-O-CH_2-Y-$ or

(3) $-CH_2CH=CH-$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl

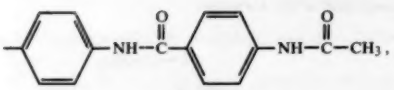
when the other is fluoro, and Y is a valence bond, $—CH_2—$ or $—(CH_2)_2—$, wherein Q is

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

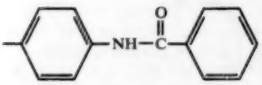
wherein

R_{60} is (a) cycloalkyl of 3 to 10 carbon atoms, inclusive, (b) aralkyl of 7 to 12 carbon atoms, inclusive, (c) phenyl, (d) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

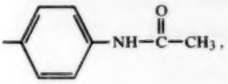
(e)



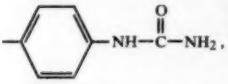
(f)



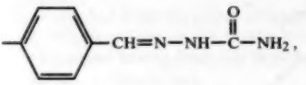
(g)



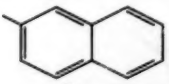
(h)



(i)

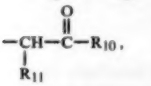


(j)



, or

(k)



wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and

wherein

X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C— or

(4) $—CH_2CH_2—$;

including the lower alkanoates thereof.

4,178,442

NOVEL CINNAMOYLES PIPERAZINES AND HOMOPIPERAZINES, THE METHOD OF PREPARING THEM AND THEIR APPLICATION IN THERAPEUTICS

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Gerard H. Moinet, Orsay; Bernard M. Pourrias, Meudon la Foret, and Anne-Marie P. Ruch, Paris, all of France, assignors to Delalande S. A., Courbevoie, France

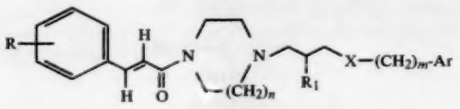
Filed Apr. 10, 1978, Ser. No. 894,965

Claims priority, application France, Apr. 19, 1977, 77 11707

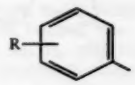
Int. Cl.[2] C07D *241/04, 243/08*

U.S. Cl. 542—440 40 Claims

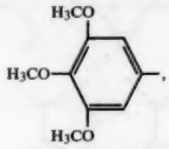
1. A compound having the formula



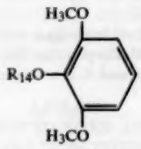
in which



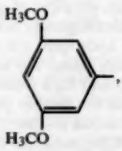
is selected from the group consisting of



4-fluorophenyl, 3,5-dimethoxyphenyl, 3,4-methylenedioxyphenyl,

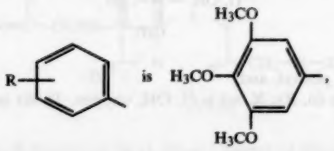


in which R_{14} is hydrogen or linear or branched alkyl having 2 or 3 carbon atoms, and

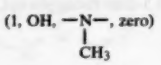


and in which

I. when

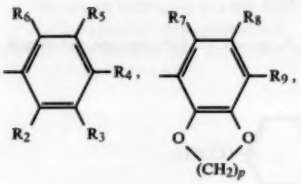


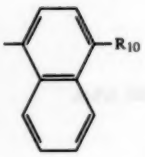
the parameters (n, R_1,X, m) are selected from the group consisting of (1, OH, oxygen, zero), (2, OH, Oxygen, zero), (1, H, oxygen, zero), (1, OH, S, zero),



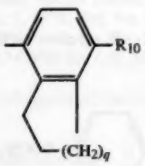
and (1, OH, oxygen, 1), and in which

A. when (n, R_1, X, m) is (I, OH, oxygen, zero), Ar is selected from the group consisting of

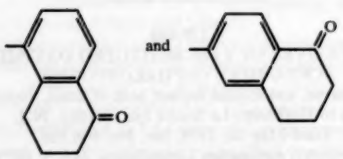




in which R_{10} is acetyl, acetamido or N-methylcarbamoylamino,

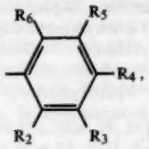


in which q is 1 or 2 and R_{10} has the same meaning as defined above,



and in which

1. when Ar is



R_2, R_3, R_4, R_5 and R_6 are selected from the group consisting of

a. R_3=R_4=R_5=R_6=H, and R_2 is chloro, fluoro, acetamido, acetyl, cyano, methoxy, methyl, allyl or allyloxy,

b. R_2=R_4=R_5=R_6=H, and R_3 is acetamido, methyl, acetyl, cyano, methoxy or chloro,

c. R_2=R_3=R_5=R_6=H, and R_4 is chloro, cyano, nitro, methylthio, benzoyl, ethyl carboxylate, methyl, linear or branched alkyl having from 3 to 5 carbon atoms, cyclohexyl, alkanoyl in which alkyl has from 1 to 3 carbon atoms, alkanoylamino in which alkyl has from 1 to 3 carbon atoms, carboxamido, N-methylcarboxamido, cyanomethyl, carboxamidomethyl or N-methylcarbamoylamino,

d. R_3=R_5=R_6=H, R_2 is fluoro and R_4 is acetyl,

e. R_3=R_5=R_6=H, R_2 is chloro and R_4 is nitro, acetyl, or N-methylcarbamoylamino,

f. R_3=R_5=R_6=H, R_2 is methyl and R_4 is chloro, acetyl, acetamido or N-methylcarbamoylamino,

g. R_3=R_5=R_6=H, R_2 is methoxy and R_4 is acetyl, propionyl, formyl, cyano, acetamido, or N-methylcarboxamido,

h. R_4=R_5=R_6=H, and R_2 and R_3 are methoxy,

i. R_3=R_4=R_5=H, and R_2 and R_6 are methoxy,

j. R_2=R_4=R_6=H, and R_3 and R_5 are methoxy,

k. R_2=R_5=R_6=H, and R_3 and R_4 together are methylenedioxy,

l. R_2=R_5=R_6=H, R_3 is methyl and R_4 is nitro, acetamido or N-methylcarbamoylamino,

m. R_2=R_6=H, and R_3, R_4 and R_5 are methoxy,

n. R_2=R_6=H, R_3 and R_5 are methyl, and R_4 is chloro,

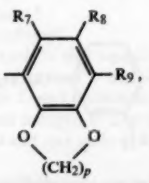
o. R_5=R_6=H, R_2 and R_3 are methoxy and R_4 is N-methylcarbamoylamino,

p. R_3=R_5=H, R_2 and R_6 are chloro, and R_4 is acetyl or N-methylcarbamoylamino,

q. R_3=R_5=H, R_2 and R_6 are methoxy and R_4 is acetyl, ethyl carboxylate or N-methylcarbamoylamino, and

r. R_6=H, R_3, R_4 and R_5 are methoxy and R_2 is acetyl, and in which

2. when Ar is



p, R_7, R_8 and R_9 are selected from the group consisting of

a. p=2, R_7=R_8=H, and R_9 is hydrogen, hydroxy, acetoxy, methoxy, methyl, ethyl, cyano, acetyl, n-butyroyl, alkoxy carbonyl in which the alkoxy is linear or branched and has from 2 to 5 carbon atoms, cyclohexyloxycarbonyl, carboxamido, N-methylcarboxamido, N-cyclohexylcarboxamido, N-phenylcarboxamido, alkanoylamino in which the alkyl is linear or branched and has from 1 to 5 carbon atoms, cyclohexylcarbonylamino, benzoylamino, N-alkylcarbamoylamino in which the alkyl is linear or branched

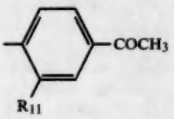
alkyl and has from 1 to 5 carbon atoms, N-cyclohexylcarbamoylamino, N-phenylcarbamoylamino, N-(paramethoxy-phenyl)-carbamoylamino, N-N-dimethylcarbamoylamino, morpholinocarbonylamino, N-N'-dimethylcarbamoylamino, ethoxycarbonylamino, hydroxymethyl, cyanomethyl, ethyl acetate, carboxamidomethyl or N-methylcarboxamidomethyl,

b. p=2, R_7=R_9=H, and R_8 is acetyl,

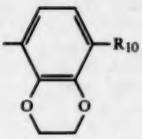
c. p=2, R_8=R_9=H, and R_7 is acetamido,

d. p=1 or 3, R_7=R_8=H, and R_9 is hydrogen, acetyl, acetamido or N-methylcarbamoylamino,

B. when (n, R_1, X, m) is (2, OH, oxygen, zero), Ar is selected from the group consisting of phenyl,

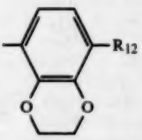


in which R_{11} is hydrogen or methoxy, and



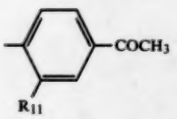
in which R_{10} has the same meaning as previously,

c. when (n, R_1, X, m) is (1, H, oxygen, zero), Ar is

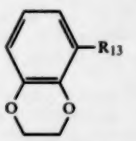


in which R_{12} is acetyl, acetamido, N-methylcarboxamido or N-methylcarbamoylamino,

D. when (n, R_1, X, m) is (1, OH, S, O), Ar is phenyl, metamethoxyphenyl, paratolyl,

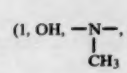


in which R_{11} is hydrogen or methoxy, or



in which R_{13} is hydrogen or acetyl,

E. when (n, R_1, X, m) is

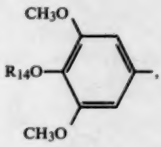


Ar is phenyl, and

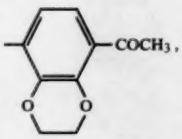
F. when (n, R_1, X, m) is (1, OH, oxygen, 1), Ar is phenyl,

II. when

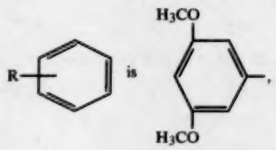
is 4-fluorophenyl, 3,5-dimethoxyphenyl, 3,4-methylenedioxyphenyl, or



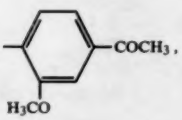
the parameters (n, R_1, X, m) are (1, OH, oxygen, zero) and Ar is



III. when



the parameters (n, R_1, X, m) are (1, OH, oxygen, zero) and Ar is



and the pharmacologically acceptable salts thereof.

4,178,443

DERIVATIVES OF 7 [-SUBSTITUTED OXYIMINS ACETAMIDO] CEPHALOSPORINS

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

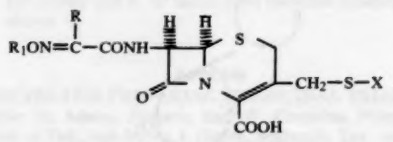
Filed May 23, 1978, Ser. No. 908,708

Claims priority, application Luxembourg, Jun. 3, 1977, 77485

Int. Cl.[2] C07D *501/36*

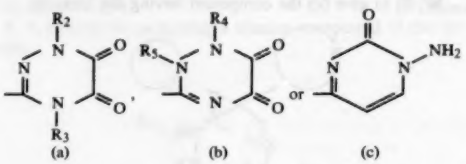
U.S. Cl. 544—27 **7 Claims**

1. A compound of the formula



(I)

wherein R represents furyl, thienyl phenyl or phenyl substituted by a member of the group consisting of halogen, hydroxy, lower alkoxy or lower alkyl, R_1 represents lower alkyl or aminocarbonylmethyl and X represents a group of the formula



(a) (b) (c)

in which one of the two symbols R_2 and R_3 or R_4 and R_5 represents hydrogen and the other represents lower alkyl, carboxymethyl or sulphomethyl,

and the pharmaceutically acceptable salts of said compounds and hydrates of said salts.

4,178,444

HYDRAZONO DERIVATIVES OF CEPHALOSPORINS

Riccardo Monguzzi, Corsico; Giorgio Pifferi, Milan; Mario Pinza, Corsico, and Giampietro Broccali, Milan, all of Italy, assignors to CRAF Sud, Aprilia Latina, Italy

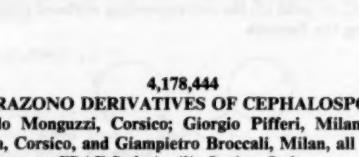
Filed Jun. 7, 1978, Ser. No. 913,475

Claims priority, application Italy, Jun. 7, 1977, 24436 A/77

Int. Cl.[2] C07D *501/36, 501/32*

U.S. Cl. 544—30 **5 Claims**

1. A hydrazonocephalosporin of the formula:



wherein R is selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl;

R_1 is hydrogen or alkyl having from 1 to 4 carbon atoms; and

R_2 is selected from the group consisting of hydrogen, acetoxy, carbamoyloxy; 1,3,4-thiadiazol-2-yl-thio; methyl-substituted 1,3,4-thiadiazol-2-yl; 1,2,3,4-tetrazol-5-yl-thio; methyl-substituted 1,2,3,4-tetrazol-5-yl-thio; and pyrid-1-yl and a corresponding salt of an alkali or alkaline earth metal, procaine, N,N-dibenzylethylendiamine, and dibenzylamine or the pivaloyloxymethyl ester or 1-(ethoxy-carbonyloxy) ethyl ester thereof.

4,178,445

7-(α-SUBSTITUTED GLYCINAMIDO)-3-SUBSTITUTED METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Tadayoshi Takano, Hirakata, and Susumu Horibe, Takatsuki, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

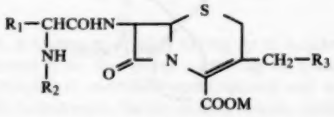
Division of Ser. No. 563,116, Mar. 28, 1975, Pat. No. 4,039,536. This application May 13, 1977, Ser. No. 796,663

Claims priority, application Japan, Mar. 28, 1974, 49-36080; Apr. 9, 1974, 49-40577; Apr. 10, 1974, 49-41130; Apr. 11, 1974, 49-41515; Apr. 11, 1974, 49-41516; Apr. 15, 1974, 49-42568

Int. Cl.[2] C07D *501/32, 501/44*

U.S. Cl. 544—30 **40 Claims**

1. Compounds of the formula:



wherein R_1 is hydrogen, lower alkyl, phenyl or thienyl,

R_2 is (a) phenyl(lower)alkanoyl, in which said phenyl is unsubstituted or substituted with one nitro,

(b) phenoxy(lower)alkanoyl, in which said phenoxy is unsubstituted or substituted with
one halogen,
one nitro,
one lower alkyl,
one lower alkoxy,
one halo(lower)alkyl,
one phenyloxycarbonyl,
one halogen at each 2- and 6-position,
one (lower)alkoxy at each 2- and 6-position,
one alkyl at each 2- and 6-position,
one nitro and one halogen at 2- and 4-positions,
or two halogens and one sulfo at 2-, 4- and 6-positions,
or

(c) phenylthio(lower)alkanoyl, in which said phenyl is unsubstituted or substituted with one halogen or one nitro,

R_3 is hydrogen, lower alkanoyloxy, or pyridinium group, provided that R_1 is hydrogen, lower alkyl or thienyl when R_2 is phenoxy(lower) alkanoyl, in which the phenyl moiety has no substituent and R_3 is lower alkanoyloxy, and

M is hydrogen,

and nontoxic pharmaceutically acceptable salt and their ester selected from lower alkyl ester, lower alkanoyloxy(lower)alkyl ester and phenyl(lower)alkyl ester, in which the phenyl is unsubstituted or substituted with 1 to 2 lower alkoxy, and

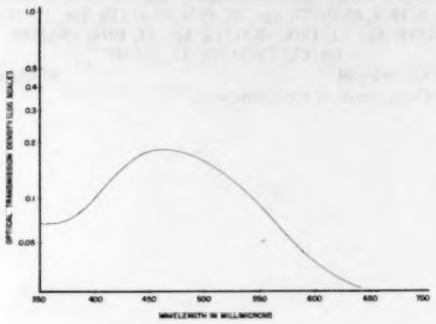
M is anionic charge when R_3 is pyridinium group.

4,178,446

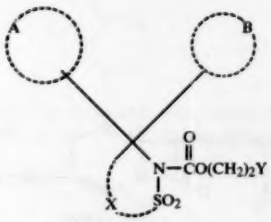
SULFAM(NA)PHTHALEINS

Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 835,998
Int. Cl.[2] C07D 275/06
U.S. Cl. 544—33 **40 Claims**



1. A compound of the formula



wherein A is a 4'-hydroxy-1'-phenyl moiety or a 4'-hydroxy-1'-naphthyl moiety; B is a phenyl moiety or a naphthyl moiety, provided A is said 4'-hydroxy-1'-phenyl moiety when B is said naphthyl moiety; X represents the carbon atoms necessary to complete 2,3-dihydrobenz[d]isothiazole-1,1-dioxide or 2,3-dihydronaphtho[1,8-de]-1,2-thiazine-1,1-dioxide; and Y is an electron-withdrawing group having a positive sigma value greater than 0.60 as defined by Hammett's Equation.

4,178,447

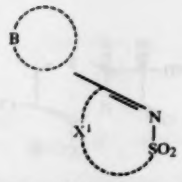
NOVEL SYNTHESIS OF 3,3-SUBSTITUTED DIHYDROBENZISOTHIAZOLE-1,1-DIOXIDES AND -2,3-DIHYDRONAPHTHO-1,2-THIAZINE-1,1-DIOXIDES

Alan L. Borror, Lexington; James W. Foley, Andover; Marcis M. Kampe, Brookline, and John W. Lee, Jr., Harvard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

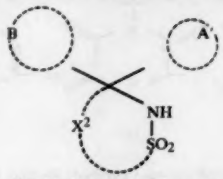
Filed Sep. 23, 1977, Ser. No. 836,025
Int. Cl.[2] C07D 275/06
U.S. Cl. 544—33 **26 Claims**

1. A process which comprises

(1) reacting (a) a 4-OP-carbocyclic aryllithium compound wherein P is a protecting group selected from a 4-OP-phenyllithium compound and a 4-OP-naphthyllithium compound and (b) a compound of the formula



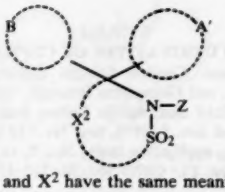
wherein B is a carbocyclic aryl moiety other than a 4'-OP-carbocyclic aryl moiety selected from a phenyl moiety and a naphthyl moiety and X^1 represents the atoms necessary to complete a benz[d]isothiazole-1,1-dioxide moiety or a naphtho[1,8-de]-1,2-thiazine-1,1-dioxide moiety in an inert solvent at a temperature between about −80° and 50° C. to give (c) the compound having the formula



wherein A' is a 4'-OP-1'-phenyl moiety or a 4'-OP-1'-naphthyl moiety; P is a protecting group; B has the same meaning given above; and X^2 represents the atoms necessary to complete a 2,3-dihydrobenz[d]isothiazole-1,1-dioxide moiety or a 2,3-dihydronaphtho[1,8-de]-1,2-thiazine-1,1-dioxide moiety;

(2) reacting said compound (c) with an excess of an acid halide of the formula W-Z wherein W is chloro or bromo and Z is a carbonyl moiety containing a

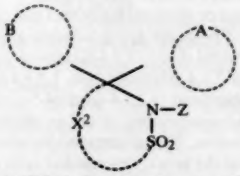
group in pyridine at a temperature between about 0° C. and 100° C. to yield (d) the corresponding acylated compound having the formula



wherein A', B and X^2 have the same meaning given above and Z is said carbonyl moiety and said

is bonded to said N atom; and

(3) treating said compound (d) with an organic or inorganic acid at a pH between about 0.1 and 5.0 at a temperature between about 20° and 100° C. to give (e) the compound having the formula



wherein A is a 4'-OH-1'-phenyl moiety or a 4'-OH-1'-napht-

hyl moiety and B, X^2 and Z have the same meaning given above.

4,178,448

PROCESS FOR PREPARING HERBICIDAL TRIAZINES

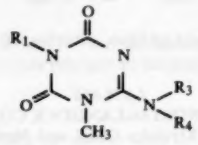
Charles D. Adams, Newark; Earl W. Cummins, Wilmington, both of Del., and Steven I. Gleich, Seabrook, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 777,324, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 675,921, Apr. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 574,351, May 5, 1975, abandoned. This application Apr. 12, 1978, Ser. No. 895,587

Int. Cl.[2] C07D *251/46*

U.S. Cl. 544—194 **15 Claims**

1. A process for preparing a triazine compound of the formula:



wherein

R_1 is C_2–C_8 alkyl, C_5–C_8 cycloalkyl, norbornyl, methylcyclohexyl, methylcyclopentyl, phenyl, or chlorophenyl;

R_3 is methyl; and

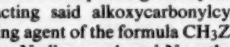
R_4 is C_1–C_4 alkyl;

said process comprising the following steps in sequence:

(a) contacting cyanamide with a C_{2-3} alkyl chloroformate to form the corresponding alkoxycarbonylcyanamide;

(b) contacting said alkoxycarbonylcyanamide with an alkylating agent of the formula CH_3Z to form the corresponding N-alkoxycarbonyl-N-methylcyanamide;

(c) contacting said N-alkoxycarbonyl-N-methylcyanamide at a pH of 5.8–8.0 with an amine salt of the formula:



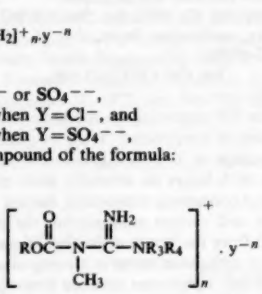
where

$Y = Cl^-$ or SO_4^{--},

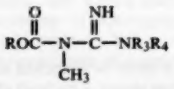
$n = 1$ when $Y = Cl^-$, and

$n = 2$ when $Y = SO_4^{--}$,

to form a compound of the formula:



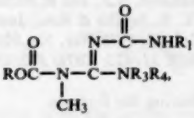
(d) contacting the product compound of step (c) with and alkali metal hydroxide to form a compound of the formula:



containing unreacted amine;

(e) removing unreacted amine, R_3R_4NH from the reaction product compound of step (d) by extraction of the product compound containing unreacted amine into an inert organic solvent and removal of unreacted amine from the extract by vaporization therefrom,

(f) contacting the product compound of step (e), from which the amine has been removed, with an isocyanate of the formula R_1NCO to form a compound of the formula:



(g) rapidly admixing a base $N'OR_5$ with amine-free product of step (f) by which the reaction product compound is cyclized to form triazine compound having the above formula and by-product alkanol and rapidly removing by-product alkanol from the cyclized reaction product by vaporization therefrom.

4,178,449

PYRAZOLO[1,5-a]PYRIMIDINES AND IMIDAZO-[1,5-a]PYRIMIDINES

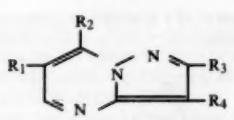
John P. Dusza, and Jay D. Albright, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 896,826, Apr. 17, 1978. This application Dec. 15, 1978, Ser. No. 970,085

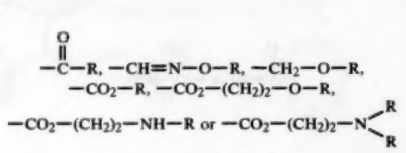
Int. Cl.[2] A61K *31/415;* **C07D** *487/04*

U.S. Cl. 544—281 **18 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl having up to 3 carbon atoms; R_2 is selected from the group consisting of phenyl, o-trifluoromethylphenyl, m-trifluoromethylphenyl and m-methoxyphenyl; R_3 is hydrogen, fluoro, chloro, bromo, cyano, cyanomethyl, carbamoyl or alkyl having up to 3 carbon atoms; and R_4 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, formyl, carboxyl, cyano, hydroxymethyl, N-hydroxyformimidoyl, alkyl having up to 3 carbon atoms and moieties of the formulae:



wherein R is alkyl having up to 3 carbon atoms.

4,178,450

2,5-DIMETHYL-BENZO(b) THIENE (3,2-f) MORPHAN AND PRECURSOR THEREOF

Ricardo Granados Jarque, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, all of Barcelona; Cristöbal Martinez Roldán, and Fernando Rabadán Peinado, both of Madrid, all of Spain, assignors to Laboratories Made, S. A., Madrid, Spain

Filed Feb. 1, 1978, Ser. No. 874,089

Claims priority, application Spain, Feb. 25, 1977, 456281

Int. Cl.[2] C07D *495/08, 409/06*

U.S. Cl. 546—63 **3 Claims**

1. 2,5-dimethyl-benzo[b]thiene[3,2-f]morphan or 2-(2-benzo[b]thienylmethyl)-1,4-dimethyl-1,2,3,6-tetrahydropyridine or one of their pharmacologically acceptable acid addition salts.

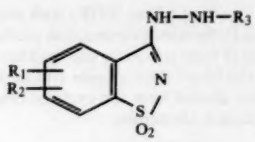
4,178,451

3-(SUBSTITUTED HYDRAZINO)BENZISOTHIAZOLE-1,1-DIOXIDES

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 13, 1978, Ser. No. 924,257
Int. Cl.[2] A61K *31/425;* **C07D** *275/06, 417/12*
U.S. Cl. 546—272 **9 Claims**

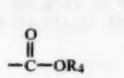
1. A compound having the formula



wherein:

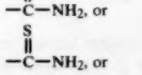
R_1 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro and R_2 is hydrogen, halogen, or alkoxy of 1 to 4 carbon atoms, provided that if R_2 is other than hydrogen, R_1 and R_2 are the same; and

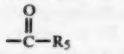
R_3 is


(i)

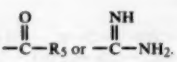
wherein R_4 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms,

(ii)


(iii)


(iv)

wherein R_5 is 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, or 2-pyrazinyl; or a pharmaceutically acceptable salt of those compounds wherein R_3 is



4,178,452

ETHYL 3-[(3,4-DIMETHOXYPHENYL)ETHYLAMINO]-1,2,5,6-TETRAHYDRO-2-OXOPYRIDINE-4-CARBOXYLATE

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,364
Int. Cl.[2] C07D *213/55*
U.S. Cl. 546—297 **1 Claim**

1. The compound ethyl 3-[(3,4-dimethoxyphenyl)ethylamino]-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate.

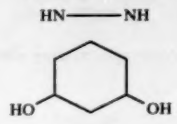
4,178,453

PROCESS FOR THE PREPARATION OF 2,5-DIDEOXYSTREPTAMINE AND OF A NOVEL INTERMEDIATE THEREFOR

Peter J. L. Daniels, Cedar Grove, and Mohammed M. N. Varchei, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 443,051, Feb. 15, 1974, Pat. No. 4,092,359. This application Jan. 13, 1978, Ser. No. 869,207
Int. Cl.[2] C07D *231/00*
U.S. Cl. 548—369 **2 Claims**

1. A compound of the formula:



and the non-toxic acid addition salts thereof.

4,178,454

STABILIZED PROSTAGLANDIN E COMPOSITION

Masanobu Naruto; Kiyotaka Ohno, and Norio Naruse, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,451
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—2 **6 Claims**

1. A stabilized prostaglandin E composition comprising a prostaglandin E having incorporated therein a stabilizing amount of methylhesperidin.

4,178,455

PROCESS FOR PREPARING AROMATIC URETHANES

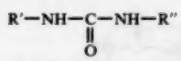
Yutaka Hirai; Katsuharu Miyata; Makoto Aiga, and Seiji Hasegawa, Omuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,543
Claims priority, application Japan, Jul. 25, 1977, 52-88441; Jul. 28, 1977, 52-89805
Int. Cl.[2] C07C *125/04*
U.S. Cl. 560—24 **38 Claims**

1. In a process for preparing an aromatic urethane which comprises reacting at temperature in the range of 80°–230° C. pressures in the range of 10–1000 Kg/cm^2G for a time ranging from 5 minutes to 6 hours an aromatic nitro compound, an organic hydroxyl-containing compound having at least one hydroxyl group, and carbon monoxide in the presence of a catalyst selected from the group consisting of platinum, palladium, rhodium or ruthenium metal or a compound thereof and mixtures thereof and a promoter selected from the group consisting of Lewis acids, Lewis acid-containing compounds and mixtures thereof, the improvement which comprises adding to the reaction system at least one compound selected from the group consisting of an organic primary amino compound of the formula

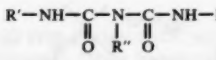
$$R_oNH_2 \quad \text{(I)}$$

where R_o represents a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, cyano, nitro, alkoxy, phenoxy, thioalkoxy, thiophenoxy, carbalkoxy, carbamate, carbamyl, carbaryloxy or thiocarbamyl substituent; a urea compound of the formula



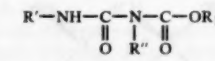
(II)

where each of R′ and R″ represents a hydrogen atom, a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, cyano, nitro, alkoxy, phenoxy, thioalkoxy, thiophenoxy, carbalkoxy, carbamate, carbamyl carbaryloxy or thiocarbamyl substituent; a biuret compound of the formula



(III)

where each of R′, R″ and R‴ has the same meaning as defined for R′ and R″ in formula (II); and an allophanate compound of the formula



(IV)

where each of R′ and R″ has the same meaning as defined for R′ and R″ in formula (II), R_1 represents a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, nitro, alkoxy, phenoxy or carbamate substituent.

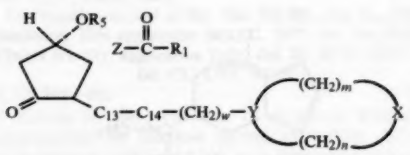
4,178,456

PROSTENOIC ACIDS AND ESTERS

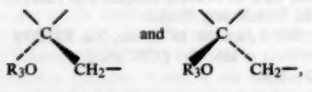
Allan Wissner, Monsey, N.Y.; Martin J. Weiss, Oradell, and Karel F. Bernady, South Sommerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,653
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 **97 Claims**

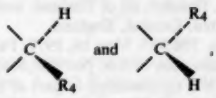
1. An optically active compound of the formula:



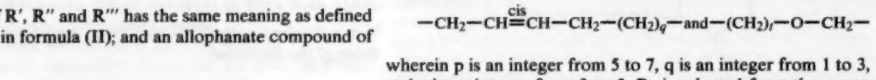
wherein R_1 is selected from the group consisting of hydroxy, tri-(C_1–C_4)-alkylsilyloxy, and C_1–C_6 alkoxy; R_5 is selected from the group consisting of hydrogen, tri-(C_1–C_4)-alkylsilyloxy and C_2–C_5 alkanoyloxy; Y is a trivalent radical selected from the group consisting of a moiety of the formula



wherein R_3 is selected from the group consisting of hydrogen tri-(C_1–C_4)alkylsilyloxy and C_2–C_5 alkanoyl; X is a divalent radical selected from the group consisting of a moiety of the formula



wherein R_4 is selected from the group consisting of C_1–C_7 alkyl, hydrogen, pehnoxy and phenoxy substituted with a compound selected from the group consisting of halogen, trifluoromethyl and methoxy; n is zero or an integer from 1 to 4; m is zero or an integer from 1 to 4, with the proviso that the sum of n and m has the value of 2 to 4; the moiety C_{13}–C_{14} is ethylene or trans-vinylene; w is zero or 1; and Z is a divalent radical selected from the group consisting of a moiety of the formula:



wherein p is an integer from 5 to 7, q is an integer from 1 to 3, and t is an integer from 3 to 5; R_5 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; the racemic mixture thereof; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

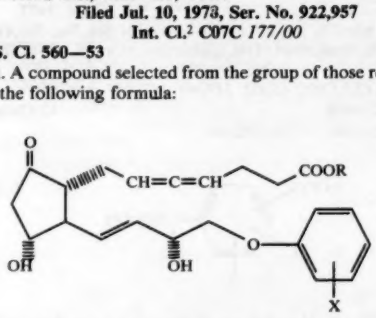
4,178,457

(DL)-16-PHENOXY- AND 16-SUBSTITUTED PHENOXY-9-KETO PROSTATRIENOIC ACID DERIVATIVES AND PROCESSES FOR THE PRODUCTION THEREOF

Albert R. Van Horn, Los Altos; Gabriel Garay, Sunnyvale, and John A. Edwards, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 10, 1978, Ser. No. 922,957
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 **10 Claims**

1. A compound selected from the group of those represented by the following formula:



(A)

wherein

R is hydrogen, a lower alkyl group of 1 to 4 carbon atoms, or the pharmaceutically acceptable, non-toxic salts of compounds in which R is hydrogen; and

X is hydrogen, o-, m-, or p-halo (fluoro, chloro or bromo), o-, m- or p-methyl or o-, m- or p-methoxy.

4,178,458

SMOKING COMPOSITION

Lina C. Teng, Richmond, Va., assignor to Philip Morris, Inc., New York, N.Y.

Division of Ser. No. 793,400, May 3, 1977, which is a division of Ser. No. 659,691, Feb. 20, 1976, Pat. No. 4,036,237. This application Oct. 17, 1978, Ser. No. 952,077
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—60 **4 Claims**

1. The compound n-amyl 2,2-dimethyl-3-hydroxy-3-phenyl-propionate.

4,178,459

N-SUBSTITUTED PARAMENTHANE CARBOXAMIDES

Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and David J. Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, England

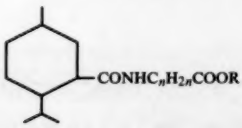
Division of Ser. No. 796,973, May 16, 1977, Pat. No. 4,150,052, which is a continuation of Ser. No. 486,566, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jan. 18, 1979, Ser. No. 4,320

Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71

Int. Cl.[2] C07C *101/18, 101/14*

U.S. Cl. 560—125 **4 Claims**

1. Substantially odorless, non-volatile physiologically active cooling compounds of the formula



where

C_nH_{2n} is a straight or branched chain alkylene group in which n is an integer of from 1–6, and

R is hydrogen, C_1–C_8 alkyl or C_1–C_8 hydroxyalkyl.

4,178,460

2-HALOALKYL(OXY-, THIO-, SULFINYL-, OR SULFONYL)-PHENYLALKANOIC ACIDS

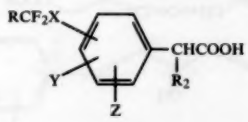
Gerald Berkelhammer, Princeton, and Venkataraman Kameswaran, Princeton Junction, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 830,515, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 728,817, Oct. 1, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 890,721

Int. Cl.[2] C07C *65/02, 149/40, 147/107, 147/14*

U.S. Cl. 562—426 **13 Claims**

1. A compound of the formula:



wherein RCF_2, X, Y and Z are all meta or para to the carbon to the acid group; X is O, S, SO or SO_2; Y and Z are each H, Cl, F, Br, NO_2, CH_3 or OCH_3; R is H, F, CHF_2 or CF_3 and R_2 is ethyl, n-propyl, isopropyl, isopropenyl or t-butyl; or the optical isomers thereof.

4,178,461

16,16-SPIROCYCLOALKYL PROSTAGLANDIN DERIVATIVES

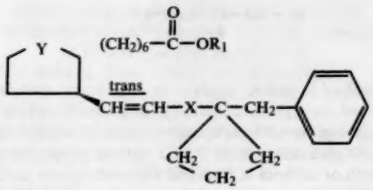
Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 592,494, Jul. 2, 1975, Pat. No. 4,028,396. This application Mar. 16, 1977, Ser. No. 778,302

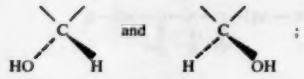
Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—463 **9 Claims**

1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof wherein X is a divalent radical selected from the group consisting of those of the formulae:



Y is a divalent radical selected from the group consisting of those of the formulae:

R_1 is hydrogen or alkyl having up to 4 carbon atoms; and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,178,462

NOVEL BICYCLODECADIENE COMPOUNDS AND PROCESS FOR PRODUCING THEM

Shingo Marumo, Owariasahi, and Masato Katayama, Nagoya, both of Japan, assignors to Noda Institute For Scientific Research, Noda, Japan

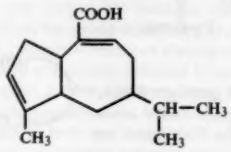
Filed Sep. 26, 1978, Ser. No. 945,831

Claims priority, application Japan, Sep. 29, 1977, 52-116139; Mar. 9, 1978, 53-25942

Int. Cl.[2] C07C *61/28*

U.S. Cl. 562—501 **2 Claims**

1. 5-Isopropyl-8-methyl bicyclo[5.3.0]deca-2,8-diene-2-carboxylic acid having a chemical structure represented by the formula



4,178,463

PROCESS FOR MAKING 4-AMINOHEX-5-ENOIC ACID

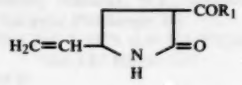
Maurice W. Gittos, Strasbourg, and Gérard J. Letertre, Souffelweyersheim, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jan. 30, 1978, Ser. No. 873,273

Int. Cl.[2] C07C *99/06*

U.S. Cl. 562—574 **2 Claims**

1. A process for the preparation of 4-aminohex-5-enoic acid or salt thereof which comprises treating a pyrrolidone compound of the formula



wherein R_1 is hydroxy, amino, or tertiary-butoxy with an excess of a strong acid, optionally preceded by treatment with an excess of a strong base, at about 100° to 150° C. for about 2 to 24 hours followed by treatment with base or application to an acid ion exchange resin when the free base is desired.

4,178,464

PROCESS FOR PRODUCING METHACRYLIC ACID

Teruhisa Sakamoto; Shigeo Nakamura, and Nobuyuki Taniguchi, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 14, 1978, Ser. No. 924,570
Claims priority, application Japan, Jul. 22, 1977, 52-87247
Int. Cl.[2] C07C *51/32, 57/04*
U.S. Cl. 562—535 **8 Claims**

1. A process for producing methacrylic acid by the vapor phase catalytic oxidation of methacrolein with molecular oxygen or a molecular oxygen-containing gas, which comprises:

conducting said oxidation reaction over a catalyst consisting of a multi-element complex oxide having the formula:

$$Mo_aP_bAs_cV_dCu_eCe_fCr_gO_h$$

wherein a=12, b=0.5 to 3.0, c=0.01 to 1.2, d=0.01 to 2.0, e=0.01 to 2.0, f=0.01 to 1.2, g=0 to 2.0 and h assumes a value which is dependent upon the valences of the other components of the catalyst within the range of 37 to 60.

4,178,465

PROCESSES FOR PREPARING PERFLUOROPOLYETHER OILS OF VERY HIGH PURITY AND LOW VOLATILITY

Gerardo Caporiccio; Costante Corti; Giorgio Belardinelli, and Giuliano Carniselli, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 708,791, Jul. 26, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,834
Claims priority, application Italy, Jul. 30, 1975, 25907 A/75
Int. Cl.[2] C07C *43/30*
U.S. Cl. 568—601 **7 Claims**

1. Process for the preparation of anhydrous selected perfluoropolyether oil fractions having an average molecular weight between 3,000 and 5,000, with a variation of 500±100 units of molecular weight for each single selected fraction, and the general formula:

$$A—O—(C_3F_6O)_m—(CF_2O)_n—(CF—O)_q—B \quad (1)$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\quad CF_3$$

wherein m is a whole number between 15 and 100, preferably betwee 15 and 50, n is a whole number between 1 and 80, preferably between 1 and 10, q is a whole number between 1 and 9, preferably between 1 and 5, the sum (m+n+q) is a number between 17 and 100, preferably between 17 and 65, the ratio n/m+q is a number between 0.06 and 1, $—C_3F_6O—$, $—CF_2O—$ and

are oxyperfluoroalkylene units randomly distributed along the chain and wherein A and B are independently selected from the group consisting of $—CF_3$, $—C_2F_5$ and $—C_3F_7$, or of oil fractions having an average molecular weight between 6,000 and 20,000, a vapor pressure equal to or below 5×10^{-11} torr at 20° C., and the general formula (2):

$$A—O—(C_2F_4O)_p—(CF_2O)_r—B \quad (2)$$

wherein p is a whole number between 30 and 300, preferably between 35 and 250, r is a whole number between 5 and 300, preferably between 6 and 250, the sum (p+r) is a number between 35 and 600, preferably between 41 and 500, the ratio r/p is a number between 0.15 and 1.5, $—C_2F_4O—$ and $—CF_2O$ are oxyperfluoroalkylene units randomly distributed along the chain; and A and B are independently selected from the group consisting of $—CF_3$ and $—C_2F_5$, said process comprising treating a perfluoropolyether oil of the formula (1) or (2), containing traces of water molecularly dissolved therein with chlorine trifluoride or chlorine monofluoride, at a pressure of 1 to 5 atm, at a temperature between 0° C. and 50° C., removing the excess chlorine trifluoride or chlorine monofluoride and the gases formed in the reaction, and subjecting the thus treated perfluoropolyether oil to selective fractionation under equilibrium conditions so as to obtain selected fractions corresponding to from 2% to 5% of the perfluoropolyether oil subjected to fractionation.

7. A perfluoropolyether oil fraction containing less than 1 ppm of water and prepared according to the process of claim 1.

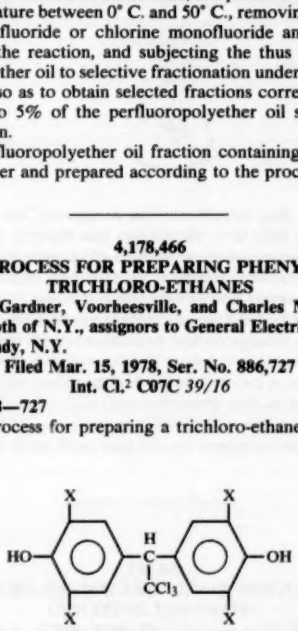
4,178,466

PROCESS FOR PREPARING PHENYL TRICHLORO-ETHANES

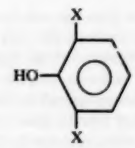
Russell A. Gardner, Voorheesville, and Charles M. Orlando, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,727
Int. Cl.[2] C07C *39/16*
U.S. Cl. 568—727 **6 Claims**

1. The process for preparing a trichloro-ethane of the formula



which comprises reacting at a temperature of from −50° to 20° C. a phenol of the formula



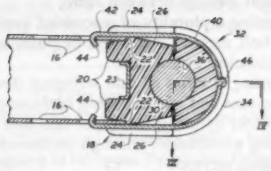
and chloral in liquid HF wherein the latter serves as both solvent and as catalyst for the reaction, and thereafter isolating the aforesaid trichloro-ethane, where X is the same or different member selected from the class consisting of hydrogen, the methyl radical and halogens.

4,178,467

BOLTLESS SPACER DEVICE

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 7, 1978, Ser. No. 922,686
Int. Cl.[2] H02G 7/12
U.S. Cl. 174—40 R 8 Claims



1. A boltless device for spacing two parallel conductors comprising

a hollow rigid arm structure adapted to extend between the conductors,

first resilient bushing means adapted to respectively engage the ends of the arm and the conductors,

second resilient bushing means adapted to respectively engage the conductors in opposed relation to the first bushing means,

two resilient metal clips, and

means associated with each clip and the rigid arm for securing the clips and arm together at locations adjacent the ends of the arm,

said clips having a shape that conforms to an outside shape and surface of the second bushing means, such that the clips engage the outside surfaces of the second bushing means the full distance of the surfaces when the clips are secured to the arm.

4,178,468

DUCT POST

George N. Jorgensen; Stephen L. Flee, and James C. Carroll, all of Oxford, Ohio, assignors to Square D Company, Palatine, Ill.

Filed May 4, 1977, Ser. No. 793,685
Int. Cl.[2] H02G 3/04
U.S. Cl. 174—48 10 Claims

1. A feeder duct post assembly including a power outlet receptacle, said assembly having securing means adjacent one end adapted to detachably secure said assembly to a ceiling rail and said assembly having engaging means at an opposite end adapted to engage a floor, the improvement comprising:

an integrally formed closed annular sheet metal post having a longitudinal axis and including an open top end and an open bottom end, said post carrying said receptacle at a position spaced intermediate said top end and said bottom end,

an integrally formed, closed, cylindrical conduit, substantially smaller in cross section than said receptacle, within said post extending parallel to the longitudinal axis of said post and defining a first compartment within said conduit adapted to extend a power line, said conduit extending from the top end of said post to a position adjacent said receptacle, said post and said conduit defining a second compartment therebetween adapted to extend a communication line therethrough;

a pair of spaced apart barrier walls in said post, each of said barrier walls extending transverse to said post axis, and spanning the cross section of said post, one of said barrier walls spaced intermediate said receptacle and said top end of said post and the other barrier wall spaced intermediate said receptacle and said bottom end of said post, said barrier walls and the portion of said post intermediate said pair of barrier walls forming an outlet box for said receptacle, said receptacle being located in said outlet box and external to said first and second compartments;

a passage in the portion of said post forming said outlet box aligned with said receptacle to enable access to said receptacle;

a barrier wall passage in said one barrier wall passing said conduit through said one barrier wall with said passage having an edge in close fitting encircling engagement with said conduit and thereby inhibiting communication between said outlet box and said second compartment, said barrier wall passage adapted to pass a power line into said outlet box for connection to said receptacle; and

a first communication passage in said post intermediate said one barrier wall and said top end of said post adapted to receive a telephone-type connector and an attached plurality of communication wires for extending said communication wires from said second compartment.

4,178,469

CLOSURE DEVICE AND FLOOR STRUCTURE UTILIZING THE SAME

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,846
Int. Cl.[2] H02G 3/28
U.S. Cl. 174—48 22 Claims

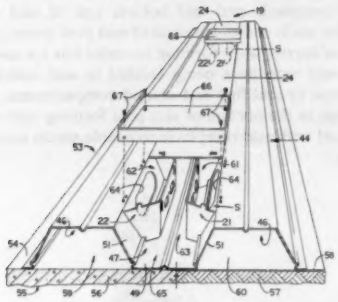
1. An electrical insert for use with an electrical underfloor distribution system to provide an electrical power outlet at the surface of the floor, said device comprising:

a first generally U-shaped member having a first vertical web, and first vertical flanges extending in the same direction from opposite ends of said first vertical web;

a second generally U-shaped member having a second vertical web spaced-spart from and generally parallel with said first vertical web, and second vertical flanges extending from opposite ends of said second vertical web in a direction away from said first flanges;

a third generally U-shaped member having a horizontal

upper web, and depending flanges adjacent to the first and second vertical webs;



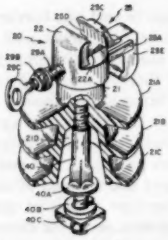
securing means securing said third U-shaped member to the first and second U-shaped members in vertically adjustable relation therewith.

4,178,470

INSULATOR FOR ELECTRICAL CONDUCTORS AND METHOD OF STRINGING SUCH CONDUCTORS ON INSULATORS

Leonard P. Jean, Nashua, and Ernest J. Lachance, Sr., Milford, both of N.H., assignors to Hendrix Wire & Cable Corp., Milford, N.H.

Filed Sep. 6, 1977, Ser. No. 830,671
Int. Cl.[2] H01B *17/16, 17/22;* **H02G** *1/04*
U.S. Cl. 174—168 **8 Claims**



1. An insulator for electrical conductors which comprises,
a body,
first jaw means integral with one end of the body of the insulator, said first jaw means having a clamping surface,
slide means,
means for mounting said slide means in said one end of the body for longitudinal movement substantially normal to the first jaw means,
second jaw means integral with said slide means, said second jaw means having a clamping surface facing the clamping surface of said first jaw means,
first passage means extending through the wall of said one end of the body beneath said first jaw means,
interiorly threaded second passage means extending longitudinally within said slide means with its axis substantially coinciding with the longitudinal centerline of said first passage means,
first bolt means comprising a portion extending through said first passage means and into said second passage means, at least the portion of said first bolt means which extends into said second passage means being provided with an exteriorly threaded portion for engaging the threads of said second passage means, and
third jaw means integral with said slide means, said third jaw means having a clamping surface and extending in a direction from said slide means opposite to the direction in which said second jaw means extends.

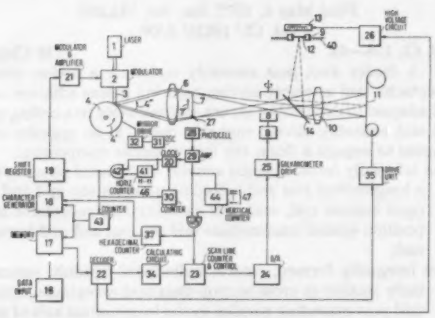
6. A method of stringing electrical conductor in a plurality of insulators including the steps of
a. providing a plurality of insulator bodies each of which comprises a portion which includes a clamping surface;
b. providing a plurality of slide means each of which is slideable transversely of an insulator body and comprises jaw means having a clamping surface facing the clamping surface of its associated insulator body;
c. providing a plurality of bolt means for moving said slide means and said jaw means towards and away from the clamping surfaces of their associated insulator bodies;
d. providing a plurality of stringing devices each of which comprises first and second semi-tubular members having means for detachably securing them together to provide a circular passage between them,
e. mounting a plurality of assembled insulators, slide means and bolt means on a series of poles of a distribution or transmission line,
f. mounting a series of said stringing devices between said jaw means and said clamping surfaces of the bodies of the insulators by manipulation of said bolt means,
g. pulling a conductor through the circular passages of said stringing devices,
h. tensioning the conductor to provide the desired amounts of sag between the poles,
i. opening said jaw means of the insulators by manipulation of the bolt means,
j. sliding the stringing devices longitudinally of the conductor outwardly of the jaw means and the clamping surfaces of the bodies,
k. separating the semi-tubular members of the stringing devices to remove them from the conductor, and
l. closing said jaw means of the insulators to grip the conductor between them and said clamping surfaces of the bodies by manipulation of the bolt means to move said jaw means towards said clamping surfaces.

4,178,471

LASER COMPUTER OUTPUT MICROFILMER WITH ELECTRICAL MISALIGNMENT CORRECTION

Masahiro Ohnishi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 7, 1978, Ser. No. 884,297
Claims priority, application Japan, Mar. 9, 1977, 52/26415
Int. Cl.[2] H04N *1/06;* **H04L** *15/00*
U.S. Cl. 178—15 **3 Claims**



1. In a laser computer output microfilmer including means for two dimensionally scanning an intensity modulated laser beam to generate a data character image on a recording medium and means for superimposing a projected format slide image over the data character image, means for correcting horizontal and vertical misalignments between the relative

positions of the data character and format slide images, characterized by:

(a) means for generating scan line synchronizing signals,

(b) means for generating clock pulses in response to said synchronizing signals,

(c) a first variable preset counter for counting said clock pulses, including means for presetting said counter,

(d) means for initiating the data character image formation in response to said first counter reaching its preset value,

(e) a second variable preset counter for counting said synchronizing signals, including means for presetting said second counter, and

(f) means for initiating an effective scan line in response to said second counter reaching its preset value, whereby the data character image may be shifted horizontally and/or vertically with respect to the format slide image in a desired direction and by a desired amount by appropriately incrementing or decrementing the preset values of said first and second counters.

4,178,472

VOICED INSTRUCTION IDENTIFICATION SYSTEM

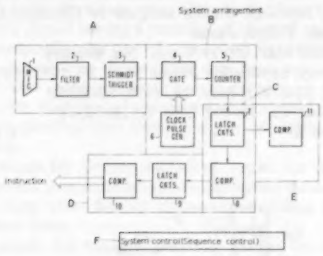
Hiroyasu Funakubo, Tokyo, and Masataka Shiba, Yokohama, both of Japan, assignors to Hiroyasu Funakubo, Tokyo, Japan

Filed Feb. 13, 1978, Ser. No. 877,394

Claims priority, application Japan, Feb. 21, 1977, 52-17143; Jan. 19, 1978, 53-3702

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SD **12 Claims**



1. A voiced instruction identification system comprising a means for detecting sound which is generated in a form divided into moras, through a microphone with provisions for mounting on a human body;

a means for sampling a fundamental wave from the detected sound;

a means for determining a value of at least one feature of the fundamental wave for each mora;

a means for forming a pattern in respect to relative changes of the value of said feature between contiguous moras; and

a means for identifying an instruction from the formed pattern.

4,178,473

TWO-WAY LOUDSPEAKER FOR VEHICLE

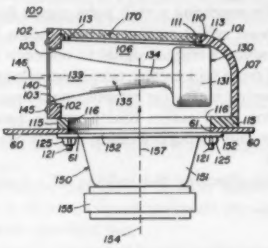
Joseph P. Vermeren, Winlock, Wash., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Jun. 26, 1979, Ser. No. 919,079

Int. Cl.² H04R *1/20*

U.S. Cl. 179—1 VE **12 Claims**

1. A combination speaker assembly for use in a vehicle comprising an annular housing having a peripheral wall with an opening therein and having first and second open ends, a first speaker for reproducing audio mid frequencies and audio high frequencies mounted essentially within said housing in alignment with said opening to project the output of said first speaker out of said housing through said opening, and a second speaker for reproducing audio low frequencies mounted adjacent to said first open end and outside of said housing to inject the output of said second speaker into said housing and past said first speaker and out said second open end, the acoustical



axis of said first speaker being arranged essentially normal to the acoustical axis of said second speaker and in use being directed essentially toward the ears of the listener.

4,178,474

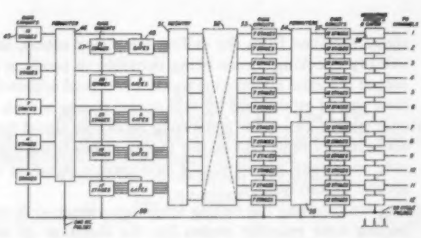
SIGNALING SYSTEM

Amos E. Joel, Jr., New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,959

Int. Cl.² H04L *9/04*

U.S. Cl. 179—1.5 R **18 Claims**



6. In a key pulse system for generating key pulses of definite length and highly irregular magnitude with intervening spaces, cyclically operating devices for generating groups of irregular sequences of pulses at a rate much higher than the rate of occurrence of said key pulses, each such group of pulses existing for the length of one of said spaces, and means to determine the magnitude of the next key pulse from the last pulse in the group of pulses occupying the preceding space.

4,178,475

METHOD AND CONTROL APPARATUS FOR RADIO PAGING SYSTEMS

Frank D. Taylor, and Ronald J. Novotny, both of Omaha, Nebr., assignors to General Communications Co., Inc., Omaha, Nebr.

Filed Mar. 9, 1978, Ser. No. 884,820

Int. Cl.² H04Q *7/04*

U.S. Cl. 179—2 EC **27 Claims**

1. A radio paging system comprising:

a plurality of telephone subscriber subsets operable to generate a plurality of tone singals, each telephone subset having an individual telephone dial number and being coupled with a telephone exchange network;

a plurality of mobile pagers, each pager being responsive to an individually coded paging signal;

paging tone encoder means for generating a plurality of individually coded paging signals, each paging signal corresponding to a different mobile pager;

means for transmitting said paging signal; and

a control apparatus coupled with said telephone exchange

network through a telephone subscriber subset such that said control apparatus is capable of receiving a ring pulse signal from a calling telephone subset, said control apparatus including:

means for receiving a ring pulse signal from said calling telephone subset, said receiving means being operable to produce a trigger signal in response to a ring pulse signal from said calling telephone subset;

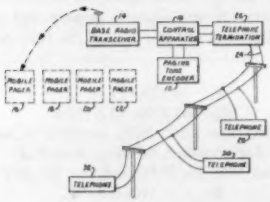
access timing means for establishing a time period of a set duration, said access timing means being operable to initiate said timing operation in response to said trigger signal;

means for checking the validity of a coded access tone signal received from the calling telephone subset, said validity checking means being operable to produce an output if a valid access tone signal is received within the time period established by said access timing means;

master timing means for generating an enable signal for a set period of time, said master timing means being operable to initiate generation of said enable signal in response to said output;

means for coupling the calling telephone subset with said paging tone encoder means for the duration of said enable signal; and

means for coupling said paging tone encoder means with said transmitting means for the duration of said enable signal.

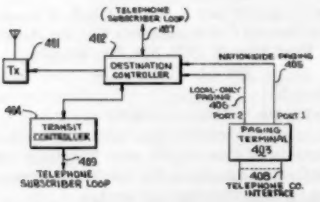


4,178,476

AUTOMATIC NATIONWIDE PAGING SYSTEM

Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Filed May 26, 1978, Ser. No. 909,988
Int. Cl.[2] H04Q *7/00;* **H04M** *11/02*
U.S. Cl. 179—2 EC **28 Claims**



1. In a paging system of the type wherein multiple subscribers are each provided with a subscriber receiver which responds to a uniquely coded radio transmission by providing a perceptible indication that the subscriber is being paged, and in which each subscriber is assigned to a home station which transmits said radio transmission throughout a prescribed geographic area served by that station, a method comprising the steps of:

responding to a predetermined command originating from at least one of said subscribers by automatically transferring page data subsequently received at said home station of said one subscriber to a further station which serves a further geographic area;

for each page intended for said one subscriber and for which page data is received at said further station, transmitting from said further station the uniquely coded radio transmission to which the receiver of said one subscriber responds; and

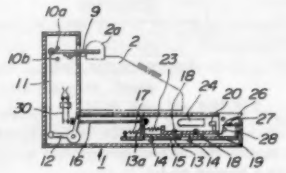
automatically suspending transmission of uniquely coded radio transmissions intended for a subscriber by the home station of that subscriber in response to receiving a suspend command from that subscriber.

4,178,477

TELEPHONE RECORDER MECHANICAL ACTUATOR

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,685
Claims priority, application Japan, Mar. 25, 1977, 52-32986; Mar. 25, 1977, 52-32987; Mar. 25, 1977, 52-32988
Int. Cl.[2] H04M *1/64;* **G11B** *31/00*
U.S. Cl. 179—6 R **8 Claims**



1. For a telephone having a handset and a switch-hook operable by the handset, a telephone answering set for use with a recording medium comprising:

a housing for receiving a telephone set,

a lever projecting from the housing into the area of the switchhook for movement in one direction when the handset goes off hook and another direction when the handset goes on hook,

pickup means in the housing for sensing messages passing through the telephone,

recording head means in the housing for recording on a recording medium,

roller means engageable with a recording medium for advancing the recording medium,

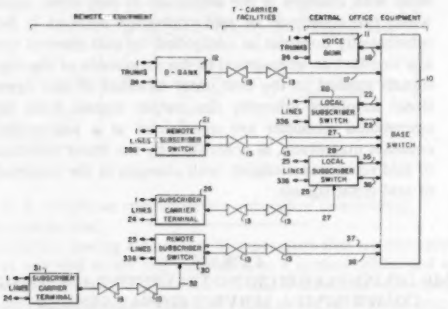
a switch coupled to the record head means for activating and deactivating the operation of said recording head means,

mechanical means having a plate and linking means coupled to the lever and said roller means as well as to said head means and engageable with said switch for moving said head means and said roller means into engagement with the recording medium in response to movement of said lever and for operating the switch so as to activate said pickup means.

4,178,478
SUBSCRIBER TERMINAL FOR USE IN A TDM SWITCHING SYSTEM

James R. Baichtal; John C. McDonald, both of Los Altos; Bradley A. Helliwell, Los Gatos; Alexander C. Ling, Mountain View, and Craig D. Schaffter, Sunnyvale, all of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,493
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AQ **12 Claims**



12. In a telephone system operating in time frames consisting of a plurality of time slots, a subscriber terminal comprising:

codec means connected to a plurality of subscriber lines for encoding and multiplexing data on said subscriber lines into a time frame corresponding to said time frame format,

memory means having a plurality of channel units, each unit corresponding to one of said subscriber lines,

means for writing the encoded data from said codec means into said corresponding channel units,

means for reading said encoded data from said channel units onto specified time slots on a pair of multitime slot data buses,

said means for writing including means for writing other encoded data from other specified time slots on said pair of buses into channel units corresponding to said subscriber lines,

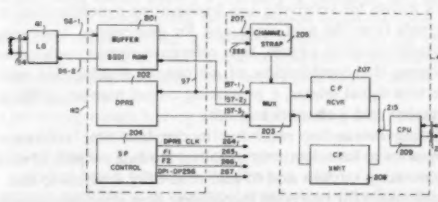
said means for reading including means for reading said other encoded data from said other channel units into said codec means,

said codec means including means for decoding and demultiplexing said other encoded data thereby connecting the decoded data to said subscriber lines.

4,178,479
COMMUNICATION PROCESSOR APPARATUS FOR USE IN A TDM SWITCHING SYSTEM

John C. McDonald; James R. Baichtal, both of Los Altos, and Craig D. Schaffter, Sunnyvale, all of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,495
Int. Cl.[2] H04J *3/12*; H04Q *3/54*
U.S. Cl. 179—15 BY **18 Claims**



18. In a telephone system operating in a multiframe format consisting of a plurality of time frames where each time frame includes a plurality of time slots and where said plurality of time frames includes signaling frames having supervisory signals where the supervisory signals occur as a signaling bit during each time slot in the signaling frame, said system including a base switch connected to a plurality of multitime slot data buses having time frames corresponding to the multiframe format, said base switch including communication apparatus comprising:

buffer means connected to said plurality of data buses for sending and receiving signaling bits on said plurality of multitime slot buses,

selector means for specifying a selected one of said plurality of buses,

multiplexer means connected to said buffer means for selecting in alternate signaling frames the signaling time slots on said specified bus,

transmitter means connected to said multiplexer means for transmitting in alternate signaling frames sequential signaling bits in the form of a first message to said selected bus,

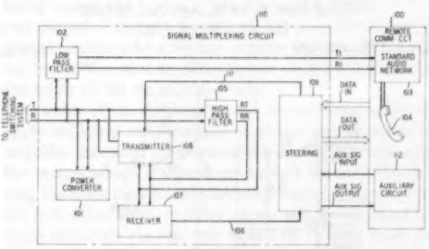
receiver means for receiving in alternate signaling frames sequential signaling bits in the form of a second message from said multiplexer means, and

processing means for controlling the operation of the apparatus.

4,178,480
SIGNAL MULTIPLEXING CIRCUIT

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1978, Ser. No. 926,422
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 BM **16 Claims**



1. A signal multiplexing circuit for use between a central communication system and a remote communication circuit for concurrently transmitting outgoing voice signals, outgoing data, and outgoing auxiliary signals from said remote communication circuit to said central communication system via a communication path which comprises a single pair of wires, wherein said signal multiplexing circuit comprises:

encoding means for converting said outgoing auxiliary signals into pulse coded signals;

isolation means for separating said outgoing voice signals, said outgoing data and said outgoing encoded auxiliary signals from each other in both frequency and time, and

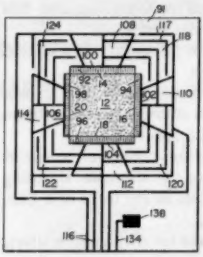
transmitting means for transmitting said separated signals to said central communication system via said single pair of wires.

4,178,481

ELECTRICAL DATA ENTRY DEVICES

Victor B. Kley, 2212 Byron St., Berkeley, Calif. 94702

Continuation-in-part of Ser. No. 712,748, Aug. 9, 1976, Pat. No. 4,079,194. This application Jan. 6, 1978, Ser. No. 867,516
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.² G08C *21/00*
U.S. Cl. 178—18 **9 Claims**



1. A graphical entry device comprising

a planar resistive sheet having a rectangular resistive graphic area with four edges and four resistive connecting means formed along and connected with the respective edges of the rectangular resistive graphic area,

four electrically conducting means joined to the respective four resistive connecting means and spaced from the resistive graphic area for connecting to external circuitry, and

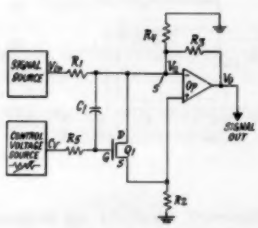
said four resistive connecting means each being configured to have an effective resistance parallel to the respective edges of the rectangular graphic area substantially higher than that of the graphic area.

4,178,482

AUTOMATIC GAIN CONTROL CIRCUIT AND SYSTEM FOR USING SAME

Maurice J. Ouellette, North Berwick, Me., assignor to General Electric Company, Somersworth, N.H.

Filed Nov. 6, 1978, Ser. No. 957,907
Int. Cl.² H04J *1/12*
U.S. Cl. 179—15 AN **10 Claims**



1. An automatic gain control circuit for substantially eliminating intermodulation frequency products from input signals applied thereto having several frequencies of which the magnitude of at least two frequencies are greater than the magnitude of the other frequencies comprising:

(a) a signal source for providing said input signals;

(b) a source of reference potential;

(c) a feedback gain controlled operational amplifier having a first input terminal connected to receive said input signals from said signal source, a second input terminal connected to said source of reference potential and an output terminal for providing output signals;

(d) a voltage source for generating a control voltage of a prescribed magnitude;

(e) a voltage controllable resistance element having a linear resistance characteristic connected across the first and second input terminals of said operational amplifier and having an input connected to receive said control voltage to establish therein a resistance of a prescribed value; and

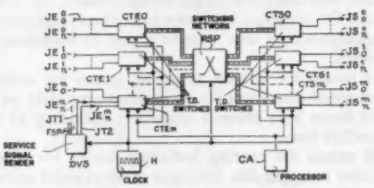
(f) a signal bypass element for coupling at least a portion of the input signals to the input of said resistance element to prevent changes in the resistance of said resistance element with changes in the amplitude of said input signals while the resistance of said resistance element is held substantially constant as controlled by said control voltage to effect an attenuation in the magnitude of the input signals applied to the first input terminal of said operational amplifier whereby the output signals from said operational amplifier are maintained at a substantially constant magnitude, as controlled by the linear resistance of said resistance element, with changes in the amplitude of said input signals.

4,178,483

TIME-DIVISION SWITCHING TELEPHONE EXCHANGE COMPRISING A SERVICE SIGNAL SENDER

Jean P. Lager, La Celle St. Cloud; Jean P. Le Pabic, Rueil Malmaison, and Jean C. Ledey, Boulogne, all of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France

Filed Sep. 29, 1977, Ser. No. 837,697
Claims priority, application France, Oct. 5, 1976, 76 29860
Int. Cl.² H04J *3/12*
U.S. Cl. 179—15 BY **6 Claims**



1. A telephone exchange comprising: a time-division switching network synchronized by means of a clock and controlled by means of a processor; and

a service signal sender for transmitting PCM encoded service signals, such as speech signals comprising short, recurrent messages or signal tones, over the time-multiplexed outgoing junctions of said time-division switching network, said PCM encoded signals originating from a plurality of generating circuits each having at least one read-only memory cyclically read under control of a counter activated by said clock, wherein the service signal sender comprises:

clock means for receiving and transmitting synchronization signals from the said clock and for generating, from said synchronization signals, time reference signals each comprising the combination of an output number for said service signal sender, a generating circuit number, a frame number and a channel number;

decoding means for receiving incomplete time reference signals and for selectively enabling the data outputs of said generating circuits and of said read-only memories; and

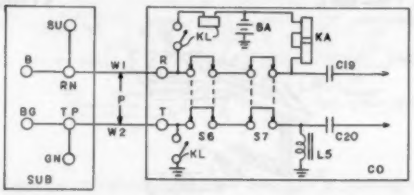
output means for receiving incomplete time reference signals and synchronization signals from said clock and for selectively enabling the injection of data outputs from said generating means into said switching network.

4,178,484

LONG LINE TELEPHONE SYSTEM WITH AN AMPLIFYING SUBSTATION

Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008

Filed Jun. 27, 1977, Ser. No. 810,417
Int. Cl.[2] H04M *1/00, 3/00*
U.S. Cl. 179—16 C **19 Claims**



1. A telephone system with a substation comprising:

in combination,

a long line having a plurality of conductors that are connected at one end to tip and ring leads at a central office and are connected at the other end to said substation, said central office having an office battery and a ringing voltage source which are connected to earth ground, said central office being adapted to operate into said long line, said long line being used to conduct alternating current signals and direct current, at each end two wires of said long line being a pair that is balanced to earth ground and has an approximate characteristic impedance, said long line being at least two miles long,

a hybrid circuit having a long branch port, a network branch port, a transmitter input, and a receiver output, said hybrid circuit having a large signal loss between the transmitter input and the receiver output, said pair being connected to the long line branch port of said hybrid circuit,

a precision network being connected to the network branch port of said hybrid circuit for the purpose of balancing said hybrid circuit, said network containing a plurality of components that are connected so as to present the approximate characteristic impedance of said pair, said network also being used to approximately terminate said pair,

a transmitter circuit having at least one amplifier, the output of said transmitter circuit having a low impedance and being connected to the transmitter input of said hybrid circuit, a microphone being connected to the amplifier input of said transmitter circuit,

a receiver circuit having at least one amplifier, the input of said receiver circuit being connected to the receiver output of said hybrid circuit, the amplifier output of said receiver circuit being connected to a speaker,

a signaling means being used to transmit numbers in the form of signals to said central office, said signaling means being switched during signaling,

a power supply furnishing D.C. power for the active elements of said substation, said power supply receiving D.C. power from said long line, the D.C. line current to said power supply being used for supervision by said central office,

a switching means having a plurality of contacts, said switching means deactivating said substation when on-hook,

an audio sound making transducer responding to the ringing voltage source of said central office, said transducer being disconnected from said long line by said switch means when off-hook,

a mounting means having a frame for holding said microphone and said speaker with at least three inches between to prevent feedback via the atmosphere, said microphone and/or speaker being vibrationally damped, and

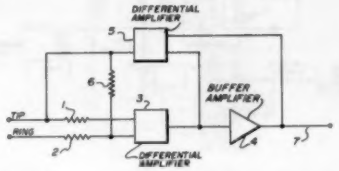
a return path being an electrical conductor other than the wires of said pair for returning direct current and ringing current from said substation to said central office, components of said substation being selected, arranged, and connected so that the interconnection of said substation to said pair is balanced to earth ground, the components of said central office being selected, arranged, and connected so that the interconnection of said central office to said pair is balanced to earth ground.

4,178,485

TRANSFORMERLESS TELEPHONE LINE CIRCUIT

Michael C. J. Cowpland, Ottawa, and Patrick R. Beirne, Stittsville, both of Canada, assignors to Mitel Corporation of Kanata, Ontario, Canada

Filed May 17, 1978, Ser. No. 906,772
Claims priority, application Canada, Feb. 1, 1978, 296137
Int. Cl.[2] H04Q *3/18*
U.S. Cl. 179—18 FA **13 Claims**



1. A telephone line circuit comprising

(a) balanced tip and ring leads for connection to a telephone set, and an unbalanced line output lead,

(b) first differential amplifier means having its input terminals connected through individual equal valued resistor means to the tip and ring leads, the values of each of the resistor means being at least 10 times the offhook impedance of the telephone set,

(c) a buffer amplifier having its input connected by a first circuit path to the output of the first differential amplifier means and its output connected by a second circuit path to the line output lead,

(d) second differential amplifier means having its input terminals connected respectively by circuit paths to said first and second circuit paths,

(e) the output of the second differential amplifier means being connected to one of the tip or ring leads,

(f) the output of the second differential amplifier means also being connected by a further resistor means to the input of the first differential amplifier means which is connected to the other of the tip or ring leads,

(g) the value of the further resistor means being selected to apply sufficient output signal from the second differential amplifier means to the input of the first differential amplifier means which is connected to said other of the tip or ring leads such as to substantially cancel a signal within the first differential amplifier means which is applied to its input terminals via said one of the tip or ring leads from the output of the second differential amplifier means.

4,178,486

RING SENSING CIRCUIT FOR USE WITH A SERVICE EVALUATION SYSTEM

John S. Young, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sep. 13, 1978, Ser. No. 941,993
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—84 R **7 Claims**

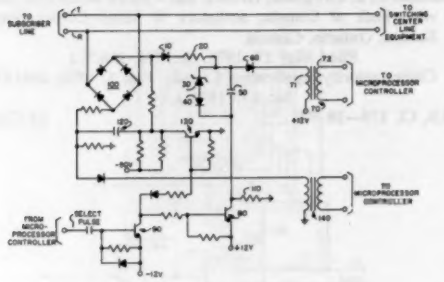
1. A ring sensing circuit for use with a service evaluation system connected to a subscriber line, said line connecting a telephone subscriber to a switching center, said ring sensing circuit comprising:

current sensing means connected to said line, operated to detect and indicate the ringing status of said subscriber line;

circuit status interrogation means connected between said

service evaluation system and said current sensing means, operated in response to said evaluation system to determine the status of said current sensing means;

said current sensing means further operated in response to said circuit status interrogation means to generate a binary output signal; and



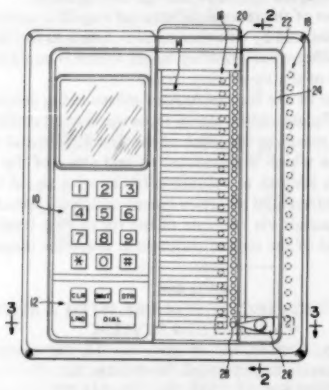
circuit status transmission means connected between said current sensing means and said service evaluation system, operated in response to said binary output signal from said current sensing means to couple said signal representing the binary status of said subscriber line to said service evaluation system.

4,178,487

SWITCH SELECTOR AND ACTUATOR

Don W. Lake, Cupertino, and Nagaraja Subramanian, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 7, 1978, Ser. No. 913,405
Int. Cl.[2] H04M *1/42*
U.S. Cl. 179—90 BD **17 Claims**



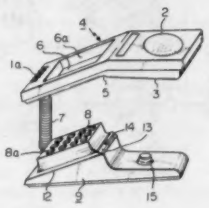
1. In electrical apparatus having a plurality of switch contacts which are selectively closed, switch actuation means comprising rail means mounted in close proximity to a row of switch contacts and yieldably biased away from said contacts, and selector means slidably mounted on said rail means with at least one contact engaging surface depending therefrom, said contact engaging surface normally being spaced from said contacts and engaging a contact upon depression of said selector means and said rail means.

4,178,488

TELEPHONE SET

Yukihiro Nishihata, Kobe, Japan, assignor to TOA Electric Co., Ltd., Japan

Filed Jul. 14, 1978, Ser. No. 924,831
Claims priority, application Japan, Aug. 2, 1977, 52/93212; Aug. 3, 1977, 52/104621[U]
Int. Cl.[2] H04M *1/02, 1/03, 1/20*
U.S. Cl. 179—100 L **9 Claims**



1. A combined loudspeaking and lowspeaking telephone set comprising:

a transmitter-receiver, said transmitter-receiver having:

a slightly bent portion at the center thereof,

a first portion on one side of said bent portion, said first portion having a microphone compartment therein and an opening therethrough, the sides of said opening connecting said microphone compartment to said bent portion, and

a second portion on the side of said bent portion opposite said first portion, said second portion having a speaker compartment therein;

microphone means in said microphone compartment for receiving sound waves;

speaker means in said speaker compartment for selectively delivering both loudspeaking and lowspeaking sound waves;

a base member shaped to receive said transmitter-receiver thereon, said base member having an inclined portion and a telephone number operating board projecting from said inclined portion; and

said opening through said first portion being removably fitted over and around said projecting operating board, whereby positioning said opening over and around said operating board permits access to said operating board through said opening and allows said first portion to rest on said inclined portion of said base member.

4,178,489

SUSPENSION SYSTEM FOR DISC RECORDING CUTTER HEAD

Arthur T. Lippel; John R. Valvo, both of Los Angeles, and Gerald B. Smith, Huntington Beach, all of Calif., assignors to Lippel Cybersonics, Inc., Sun Valley, Calif.

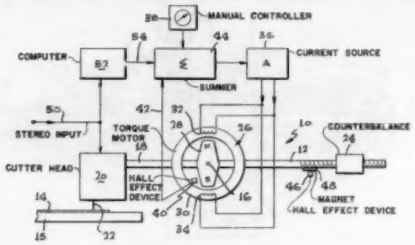
Filed May 1, 1978, Ser. No. 901,574
Int. Cl.[2] G11B *3/14*
U.S. Cl. 179—100.4 C **24 Claims**

1. A suspension system for a disc recording cutter head, said suspension system comprising:

an arm, pivot means for supporting said arm on a generally horizontal pivot axis so that said arm swings in a generally upright plane, means on the inner end of said arm for attachment of a cutter head for carrying a record cutting stylus, and a counterbalance on the outer end of said arm, said counterbalance being adjusted to balance said arm and attachments thereto about said pivot axis of said arm;

a DC torque motor mounted on said arm on said pivot axis for rotation of said arm around its pivot axis, said torque motor including at least one energizing coil for causing

said torque motor to produce torque in a direction to urge a stylus toward a recording disc; and



means for energizing said torque motor for producing torque in said torque motor and producing recording disc cutting force at the stylus.

4,178,490

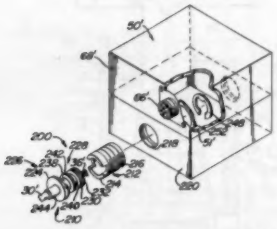
TAMPERPROOF HANDSET FOR RAILROAD APPLICATIONS

Charles A. Boenecke, 1 Capshire Dr., Cherry Hill, N.J. 08003

Continuation-in-part of Ser. No. 760,877, Jan. 21, 1977, Pat. No. 4,087,659. This application Apr. 13, 1978, Ser. No. 896,073

Int. Cl.[2] H04M *1/03*

U.S. Cl. 179—178 **2 Claims**



1. A tamperproof handset for installation in a railroad communication control having a housing provided with a front panel which has a threaded hole, said handset having a cable and a plurality of wires disposed within said cable for electrically connecting said control and handset, comprising:

a connector having a male section and a female section;

said female section having a slotted section and a threaded section, said female threaded section extending within the interior of said housing and being threadedly secured to said front panel within said front panel threaded hole;

said male section having a key section, a swaged section and a slotted section provided with an annular slot, said male section having a passage extending therethrough, said male key section matingly engaging said female slotted section;

said female section having a cylindrical passage extending therethrough for receiving said male swaged section and said male slotted section;

a retainer disposed within said annular slot and frictionally secured to said male slotted section to prevent displacement of said male connector section with respect to said female connector section;

a jam nut threadedly secured to said female threaded section extending within the interior of said housing, said jam nut frictionally contacting said housing to prevent rotation of said female threaded section; and

said handset cable passing through said male connector passage into the interior of the housing.

4,178,491

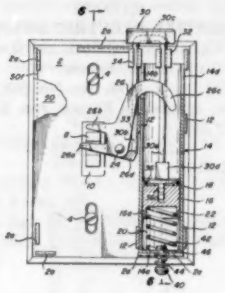
SWITCH ACTUATOR MEANS OF THE TIME DELAY TYPE

Don W. Orscheln, and Robert D. Bopp, both of Moberly, Mo., assignors to Orscheln Brake Lever Mfg. Co., Moberly, Mo.

Filed Oct. 7, 1977, Ser. No. 840,373

Int. Cl.[2] H01H *43/00*

U.S. Cl. 200—34 **6 Claims**



1. Time delay means for operating an electrical switch mounted in a switch box, said switch having an operating lever projecting from the face of said switch box and being pivotable between ON and OFF positions, comprising:

(a) a switch plate (**2**) adapted for mounting on the face of the switch box, said switch plate containing an aperture (**10**) for receiving the switch lever;

(b) a hollow cylinder (**14**) secured to said switch plate, one end of said cylinder being closed and the other end being open to atmosphere;

(c) a piston (**16**) arranged for sliding movement in said cylinder;

(d) one-way seal means (**18**) connected with said piston for defining a substantially fluid-tight chamber adjacent the closed end of said cylinder, said seal means comprising a flexible annular seal secured to the end of said piston remote from said closed cylinder end, said seal having a generally cup-shaped configuration with an annular circumferential lip portion in sliding engagement with the inner circumferential wall surface of said cylinder, said lip portion extending toward the open cylinder end;

(e) spring means (**22**) biasing said piston toward the said cylinder open end;

(f) activating means (**30**) for displacing said piston against the biasing force of said spring means toward a first position adjacent the closed end of the cylinder, thereby to force fluid out of said chamber via said seal means, said seal means being operable, when said piston is in the first position, to gradually leak fluid back into said chamber at a predetermined rate, whereby said piston is displaced by said spring means toward a second position adjacent the open end of said cylinder; (g) vent means for venting said chamber when said piston is in an intermediate position between said first and second positions, said vent means comprising a slot (**14*b***) contained in and extending axially from the open end of said cylinder; and

(h) a switch lever operating member (**26**) pivotally connected intermediate its ends with said switch plate for movement about a pivot axis normal to said switch plate, said operating member being adapted for engagement at one end with said lever, the other end (**26*c***) of said operating member extending through said slot for engagement by said piston when said piston is adjacent said intermediate position, said operating member being pivoted by said piston from a switch-on position to a switch-off position when said piston is displaced from its intermediate position to its second position, respectively, whereby said piston travels at a given velocity from said first position to

said intermediate position, and at a higher velocity from said intermediate position to said second position, thereby to quickly pivot said operating member from the switch-on position to the switch-off position.

4,178,492

INERTIAL ELECTRIC SWITCH

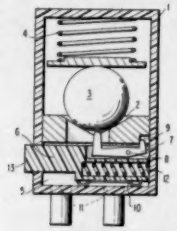
Carol Roesch, 6, Chemid du Wahflock, and René Heinimann, 42, rue du Tir, both of Colmar, France

Filed Jan. 3, 1978, Ser. No. 866,784

Claims priority, application France, Jan. 5, 1977, 77 00797; Nov. 23, 1977, 77 35974

Int. Cl.[2] H01H *35/10*

U.S. Cl. 200—61.45 R **6 Claims**



1. An inertial electric switch, comprising a housing, a conical seat in said housing, an inertial ball in said housing, a spring in said housing that presses said ball onto said seat, a slider mounted for sliding movement in said housing in a direction perpendicular to the axis of said conical seat between an armed position and an unarmed position, first electrical contacts carried by said slider, second electrical contacts fixedly carried by said housing in a position to be engaged with and disengaged from said first contacts in accordance with the said position of said slider in said housing, means for urging said slider from said armed toward said disarmed position, a latch swingably carried by said slider, said latch having two ends and being mounted for swinging movement on said slider about an axis spaced between said two ends, one of said ends extending through a central opening in said seat a distance sufficient to contact said ball when said ball is centered on said seat, the other of said ends comprising a hook that is adapted to engage in a recess in said housing, said ball contacting said one arm to maintain said latch in a position such that said hook is maintained in said recess in said armed position of said slider, and a resetting button to move said slider from said disarmed to said armed position.

4,178,493

PUSHBUTTON SWITCH WITH COLLAR

Heinrich Sauer, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

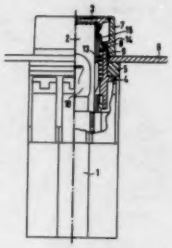
Filed Dec. 18, 1978, Ser. No. 970,216

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800492

Int. Cl.[2] H01H *3/12, 13/04, 9/00*

U.S. Cl. 200—159 R **3 Claims**

1. In a front mounted pushbutton switching device mounted by means of a front ring screwed onto an external thread of a collar, the improvement comprising a disc shaped pushbutton having a diameter larger than that of the external mounting thread, the front ring having inward projecting extensions with an internal thread matched to the external thread, and the



pushbutton having cutouts corresponding to the extensions at its circumference.

4,178,494

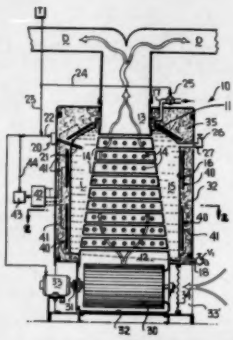
MICRO-WAVE AIR HEATER

Frank P. Bottalico, and Frank P. Bottalico, Jr., both of 9803 Healy Ct., Upper Marlboro, Md. 20870

Filed Nov. 10, 1977, Ser. No. 850,351

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 R **12 Claims**



1. A micro-wave air heater comprising a hollow air duct through which air is adapted to pass from an input end portion toward and through an output end portion thereof, a plurality of tubular conduits spanning said duct within an interior thereof between said input and output end portions, microwave transparent wall means externally of and in generally spaced relationship to said duct and defining therewith a liquid chamber, a liquid in said tubular conduits and said liquid chamber, and micro-wave generating means exteriorly of said liquid chamber for generating micro-wave energy for heating said liquid whereby air passing through said duct and past said tubular conduits is heated.

4,178,495

APPARATUS FOR WELDING STUDS TO WORKPIECES

Steve Spisak, Elyria, and Thomas E. Shoup, Amherst, both of Ohio, assignors to TRW, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 648,052, Jan. 12, 1976, Pat. No. 4,074,103. This application May 18, 1977, Ser. No. 798,141

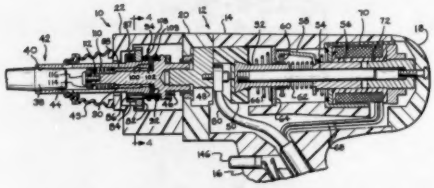
The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.[2] B23K *9/20*

U.S. Cl. 219—98 **8 Claims**

1. Apparatus for welding a stud to a workpiece having an electrically-resistant coating thereon, said apparatus comprising a welding tool having chuck holding means extending

outwardly therefrom for holding a weldable stud, means for moving said chuck holding means toward and away from the workpiece, means connected to said chuck holding means for rotating said chuck holding means, a disc positioned between



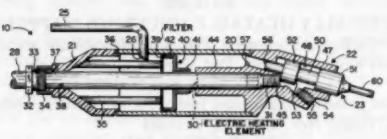
portions of said chuck holding means and said moving means and in contact with both, electrically-conducting arcuate members located around said disc, and means for urging said members inwardly against portions of said chuck holding means and said moving means.

4,178,496

DESOLDERING ATTACHMENT FOR SOLDERING INSTRUMENT

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Sep. 22, 1977, Ser. No. 835,670
Int. Cl.[2] B23K *3/00*
U.S. Cl. 219—230 **10 Claims**



1. The combination of a desoldering attachment and a soldering instrument, said combination comprising:

(a) a soldering instrument of the type including a handle having a heater sleeve extending forwardly therefrom;

(b) an electric heater element disposed in said heater sleeve, and said heater sleeve having an outwardly threaded forward end portion adjacent said heating element, and having external locking collar engaging threads spaced rearwardly therefrom;

(c) a housing sleeve surrounding said heater sleeve in spaced relation thereto and defining a solder receiving chamber surrounding said heater sleeve;

(d) a vacuum tube extending outwardly from the interior of said housing sleeve for communicating said chamber with a source of vacuum;

(e) an end cap engaging said heater sleeve and said housing sleeve for closing the rear end of said housing sleeve and having an opening for permitting the forward end of said heater sleeve to extend therethrough into said housing sleeve;

(f) a filter screen in said housing sleeve;

(g) means on said end cap for spacing said filter screen within said housing sleeve forwardly of said vacuum tube;

(h) a vented solder baffle means disposed in said housing sleeve and adapted to rest against the front of said filter screen;

(i) a head portion engaging said housing sleeve and said heater sleeve for closing the front end of said housing sleeve and having internal threads receivingthe external threads on said heater sleeve;

(j) a hollow desoldering tip supported for movement back and forth axially within said head portion and communicating with the interior of said housing sleeve forwardly of said baffle means, said tip extending off center with respect to the longitudinal axis of said heater sleeve, a portion of said tip being engageable by the forward end of said heater sleeve and acting as a stop to limit the extent to which the forward end of said heater sleeve can be threaded into the threads of said head portion, the extent to which the heater sleeve can be threaded into the head portion determining the angular position of the tip with respect to the vacuum tube, and

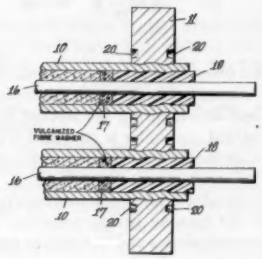
(k) adjustable locking means extending through said head portion into engagement with said tip for adjustably limiting the axial motion of said tip within said head portion, the angular position of said tip with respect to said vacuum tube being adjustable by adjusting the axial position of said tip within said head portion by said locking means.

4,178,497

END SEALS FOR ELECTRIC IMMERSION HEATING ELEMENTS

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 10, 1977, Ser. No. 805,594
Int. Cl.[2] H05B *3/82;* **H01C** *1/03;* **H02G** *15/04*
U.S. Cl. 219—336 **7 Claims**



1. In an electric heater for a water tank, said heater having a tubular metal sheath, a portion of which is adapted to be immersed within the water in said tank, a resistance conductor within said sheath, a metal terminal pin having one end within an end of said sheath and electrically connected to an adjoining end of said resistance conductor and having an opposite end extending outwardly of said sheath end for connecting said resistance conductor to a source of electrical energy to create heat, and insulating material within said sheath for electrically insulating resistance conductor and said terminal pin from said sheath and for conducting heat from said resistance conductor to said sheath, said insulating material stopping short of said sheath end to form a pocket thereat, the improvement comprising an improved end seal for said heater, comprising:

a resilient insulating plug within said pocket, the wall of said sheath at said pocket having an inward deformation to lock said plug in position within said pocket and to hold it in sealing engagement with the inner peripheral surface of said sheath and the peripheral surface of said terminal pin,

an electrically insulative fibrous member held within said pocket by said insulating plug in position between the latter and that portion of said insulating material forming the bottom of said pocket, said fibrous member spanning the adjacent peripheral space between said terminal pin and the inner surface of said sheath,

said fibrous member being resistant to abnormal heat within said sheath and adapted to absorb water which may enter the sheath in the event of fracture of that portion of the latter immersed in the water in said tank, absorption of water causing said fibrous member to swell to sealing engagement with the inner peripheral surface of said sheath and the peripheral surface of said terminal pin,

said inward deformation providing a stop to restrict movement of said fibrous member outwardly of said pocket in the event said resilient plug is unlocked from its said

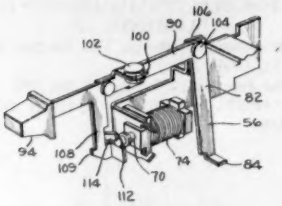
position within said pocket, and in the event water pressure applied against said fibrous member is of sufficient force to tend to move the latter in a direction outwardly of said pocket.

4,178,498

ELECTRIC TOASTER CONTROL

Paul V. Snyder, Whitehall, Pa., assignor to General Electric Company, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 848,884
Int. Cl.[2] F27D *11/02*; A21B *3/02*
U.S. Cl. 219—413 **6 Claims**



1. In an electric oven toaster wherein electric heating means supplies heat to a toasting chamber, switch means is provided for energizing and de-energizing the electric heating means, and a toasting period controller is provided for opening the switch means to de-energize the heating means at the end of a toasting cycle the improvement comprising:

a. a manually operable lever positioned between said switch means and said toasting period controller for manually closing the switch means and starting the operation of the toasting period controller;

b. said toasting period controller including a solenoid arranged to be actuated at the end of a toasting cycle;

c. said solenoid including a solenoid coil and a movable armature member;

d. said switch means being spring biased to an open position and said lever including a latch arm which is movable into engagement with the armature member of said solenoid for holding the lever and said switch in a closed position against the spring bias of said switch; and

e. said toasting period controller including means for actuating said solenoid at the end of the toasting cycle to move said armature to release said latch arm from said armature at the end of a toasting cycle to permit the switch to be opened under the force of its spring bias and to move the lever to an off position.

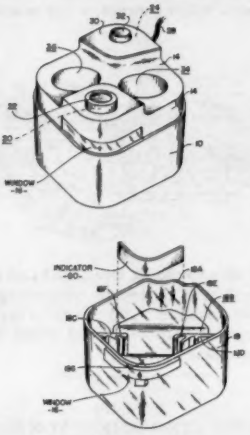
4,178,499

HEATING UNIT INDICATOR FOR DISINFECTING SOFT LENSES, OR THE LIKE

John G. Bowen, Santa Ana, Calif., assignor to Rincon Industries, Inc., Woodland Hills, Calif.

Filed Sep. 21, 1977, Ser. No. 835,420
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—439 **3 Claims**

1. An electrically energized heating unit comprising: a bowl having an open top; an incubator supported on and covering the open top of the bowl, said incubator including at least one well extending into said bowl; electrical heating means mounted in said bowl; wax contained in said bowl to be heated from a solid state to a molten state by said electrical heating means when the unit is energized so as to introduce heat into said well; at least a portion of said bowl being transparent and forming a window; and an indicator mounted in said bowl, displaced inwardly from said window, to be visible through said window when the wax in said bowl is in a molten state and



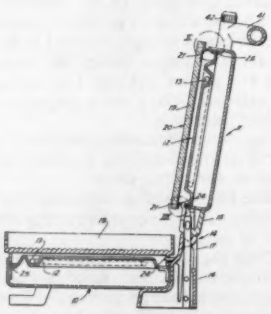
to be invisible through said window when the wax in said bowl is in a solid state.

4,178,500

ELECTRICALLY HEATABLE HOUSEHOLD APPLIANCE

Dieter Brindöpke, Mettmann, Fed. Rep. of Germany, assignor to Robert Krups, Solingen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,567
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711402; Nov. 19, 1977, 7735481
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—524 **19 Claims**

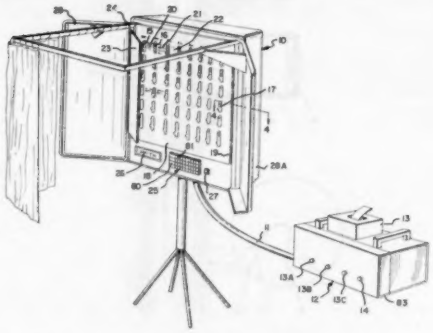


1. An electrically heatable household appliance comprising a stationary lower part and a movable upper part, each of said parts being provided with an electrically heating infrared radiating member, a heat-reflecting supporting member for each heating member, an adjustable hinge joint for swingably connecting said movable part to said lower part and for adjusting the level of said upper part with respect to said lower part, means for holding said movable upper part in a predetermined position with respect to the lower part, a protective plate for each heating member, at least one of said plates being of a glass ceramic material having at least 70% transparency to infrared radiation, said protective transparent plate being disposed directly above and operatively spaced from said electrically heating member.

4,178,501
ELECTRONIC VOTING MACHINE

Henry D. Luther, Massillon, Ohio, assignor to R. F. Shouptronics Corp., Bryn Mawr, Pa.

Filed Sep. 17, 1976, Ser. No. 724,120
Int. Cl.[2] G07C *13/00*
U.S. Cl. 235—54 F **2 Claims**



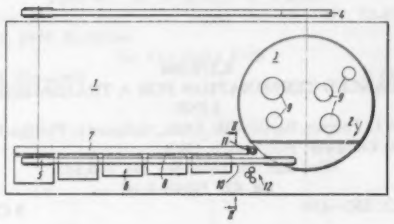
1. A voting system comprising:
an electronic memory for storing votes cast for candidates,
a plurality of voting switches connected to said memory for storing said votes therein when said switches are actuated, said voting switches being mounted on a panel of said voting system, said panel having ballot information thereon,
a shield having one or more sets of ballot information thereon, with cut-out portions on said shield and exposing said switches, said shield being movable with respect to said panel so that said shield can be moved to one position with one set of ballot information visible adjacent to said voting switches, and moved to another position with another set of ballot information visible adjacent to said switches, and
switch means operated coincidentally with movement of said shield, said switch means connecting said voting switches to one portion of said memory when said shield is in said one position and to a different portion of said memory when it is in said other position whereby the same voting switches can be used to vote for two different groups of candidates.

4,178,502
ARRANGEMENT FOR COUNTING COINS OF DIFFERENT DIAMETERS

Thomas Zimmermann, Berlin, Fed. Rep. of Germany, assignor to F. Zimmermann & Co., Berlin, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,663
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713844
Int. Cl.[2] G07D *9/00*
U.S. Cl. 235—92 CN **9 Claims**

1. An arrangement for counting coins of different diameters and similar disk-shaped objects conveyed in irregular sequence, comprising: guide track means with guide edge for contacting the edge of said coins; a plurality of electronic proximity sensors located in said guide track means for identifying said coins and delivering identification signals; electronic evaluation and display means for receiving identification signals delivered by said proximity sensors; said electronic proximity sensors being offset along a line perpendicular to said guide edge at a distance from said guide edge such that paths of motions of coin edges away from said guide edge of several coins to be identified by one of said proximity sensors are located in active areas of said proximity sensors; said proximity sensors being capable of emitting analog linear identification signals proportional to coverage of said active areas of said proximity sensors by coins in transit, said coverage being determined by said paths of motion; the number of proximity

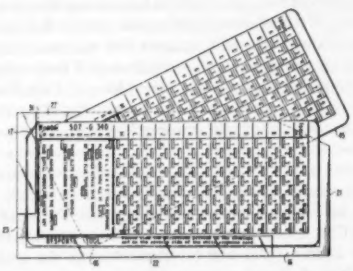


sensors being minimum for a maximum number of coins of different diameter to be identified and their values totaled.

4,178,503
MARKING MESSAGE CARD AND TEMPLATE ASSEMBLY AND RELATED INPUT SWITCHING CIRCUITRY AND METHOD OF MAKING THE ASSEMBLY

Edward J. Corwin, 200 Central Park South, Apt. 11A, New York, N.Y. 10019

Division of Ser. No. 750,322, Dec. 13, 1976, Pat. No. 4,127,769, which is a continuation-in-part of Ser. No. 257,298, May 26, 1972, Pat. No. 4,001,549, which is a continuation-in-part of Ser. No. 151,676, Jun. 10, 1971, abandoned. This application Sep. 12, 1978, Ser. No. 941,897
Int. Cl.[2] G06K *21/06*; G08C *9/06*
U.S. Cl. 235—495 **5 Claims**



1. A marking template assembly for holding a message card containing marking areas thereon, said assembly comprising:
a generally rectangular base member having a notch in one corner thereof;
an upstanding rim extending around the periphery of said base member, except for said notch;
a generally rectangular template of the same general shape as said base member, except for said notch, and sized to fit within said rim to form a card-receiving cavity with one corner of said template extending through said notch, said template having marking openings corresponding to the marking areas;
a first strip of pressure-sensitive tape securing together the outer surfaces of one pair of adjacent short sides of said template and rim, these short sides being non-adjacent to said notch; and
a second strip of tape securing together the outer surfaces of only one pair of adjacent long sides of said template and said rim, these long sides being non-adjacent to said notch, thereby forming a jacket-like structure which permits a

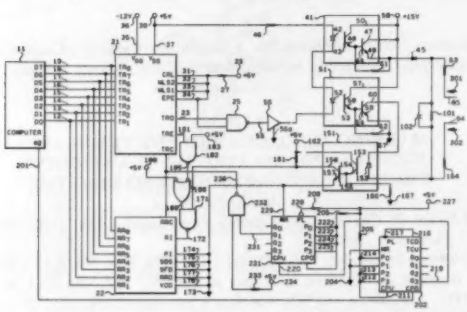
card to be inserted therein through said notch without any hinging action between said template and said base member.

4,178,504

BALANCED TERMINATION FOR A TRANSMISSION LINE

Robert L. Farmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 18, 1978, Ser. No. 870,545
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **9 Claims**



1. Apparatus comprising:

a first optical isolation means having an input stage and an output stage;

a transmission line means which is made up of a transmit line having first and second ends and a receive line having first and second ends, said transmit line and said receive line forming a current loop, the first end of said transmit line forming the input of said current loop and the first end of said receive line forming the output of said current loop, the second end of said transmit line being resistively connected to the second end of said receive line, the first end of said transmit line being electrically connected to the output stage of said first optical isolation means;

means for supplying a first digital signal to the input stage of said first optical isolation means in such a manner that said first digital signal will be transmitted as the presence or absence of electrical current flow on said transmit line;

a second optical isolation means having an input stage and an output stage;

means for electrically connecting the first end of said receive line to the input stage of said second optical isolation means;

a third optical isolation means having an input stage and an output stage, said third optical isolation means being in an on condition when said first optical isolation means is in an on condition and said third optical isolation means being in an off condition when said first optical isolation means is in an off condition;

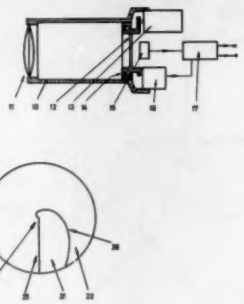
means for electrically connecting the input stage of said second optical isolation means to the output stage of said third optical isolation means in such a manner that the first end of said transmit line and the first end of said receive line are electrically balanced when electrical current is flowing in said transmit line, and the first end of said transmit line and the first end of said receive line are also electrically balanced when electrical current is not flowing in said transmit line.

4,178,505

DEVICE FOR DETERMINING THE DIRECTION TOWARDS A REMOTE OBJECT

Lars-Erik Skagerlund, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 14, 1977, Ser. No. 860,519
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **12 Claims**



1. An apparatus for measuring the coordinates of a target source of radiation with respect to a reference point within a particular field of view, comprising:

means for generating one or more clearly defined sensitivity beams, the sensitivity beams shaped to define a source locating area positioned at said reference point and bounded by a straight line on one side and a substantially logarithmic curve on the other side, said straight line and said logarithmic curve meeting at said reference point;

means for rotating said sensitivity beams about said reference point at a reference frequency to scan said source locating area over said field of view;

means for focusing an image of said target source of radiation in a plane including said source locating area;

detector means for generating at least one electrical signal in response to the radiant energy passed by said sensitivity beams when said source locating area scans across the image of said target source of radiation, said at least one electrical signal defining a time duration corresponding to the radial distance of said target source from said reference point and said at least one electrical signal being shifted in phase with respect to said reference frequency by an amount corresponding to the angular position of said target.

4,178,506

METHOD FOR DETECTING FRACTURES IN FORMATIONS SURROUNDING EARTH BOREHOLES

Walter H. Fertl, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

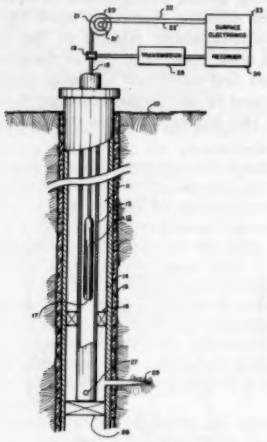
Filed Sep. 6, 1977, Ser. No. 830,554
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—260 **6 Claims**

1. A method for locating a fracture in earth formations, comprising:

traversing an earth borehole with a gamma ray detection system, thereby creating a base log;

injecting a fluid containing a salt from the group consisting

of potassium, thorium and uranium salts into the formation of interest; and



thereafter traversing the said earth borehole with said gamma ray detection system, thereby creating a second log indicative of a profile of said fracture.

4,178,507

IONIZATION OF ORGANIC SUBSTANCES ON CONVEYOR MEANS IN MASS SPECTROMETER

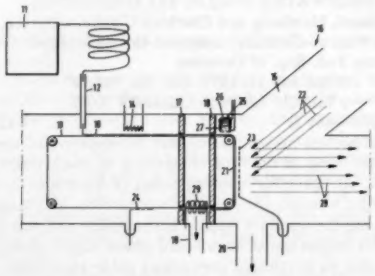
Curt Brunnée, Platjenwerbe; Jochen Franzen, Wildeshausen, and Stefan Meier, Bremen, all of Fed. Rep. of Germany, assignors to Varian Mat GmbH, Bremen, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,579

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1976, 2654057

Int. Cl.[2] B01D *59/54;* H01J *39/34*

U.S. Cl. 250—282 **14 Claims**



1. A method for analyzing samples of organic substances in a mass spectrometer comprising the steps of:

transferring a sample of a substance to be analyzed in a solvent from a liquid chromatograph onto a moving continuous belt;

vaporizing the solvent on the belt;

moving the belt so as to move the sample into an ionization chamber associated with a mass spectrometer;

ionizing the sample directly on the belt in the ionization chamber; and

removing the ions from the belt and conducting them into the mass spectrometer.

4,178,508

DEVICE FOR CONTROLLING AMOUNT OF X-RAY IRRADIATION

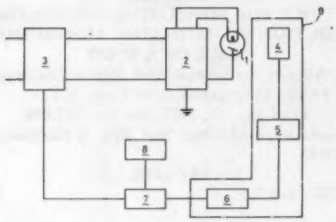
Toshihiro Hotta, Yashiki, and Takao Makino, Hikone, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 26, 1978, Ser. No. 928,057

Claims priority, application Japan, Jul. 30, 1977, 52-91793; May 11, 1978, 53-56244

Int. Cl.[2] G01J *1/42*

U.S. Cl. 250—355 **7 Claims**



1. A device for controlling an amount of X-ray irradiation in an X-ray apparatus having an X-ray tube, said device comprising:

a high-voltage transformer circuit having a primary side and a secondary side, said secondary side being connected to said X-ray tube;

a main control circuit for supplying preheating voltage to said X-ray tube and for applying tube voltage to said X-ray tube via said primary side of said high-voltage circuit;

an X-ray irradiation amount measuring circuit for measuring the amount of X-rays irradiated from said X-ray tube and for integrating the amount measured;

an X-ray irradiation amount setting circuit for presetting an amount of X-rays to be irradiated; and

a comparison circuit for comparing the integrated measured value from said X-ray irradiation amount measuring circuit with said preset amount of X-ray irradiation from said X-ray irradiation amount setting circuit and for generating an X-ray tube operation deactuating signal to said main control circuit when both said integrated value and said preset amount are in agreement with each other whereby when the measured amount of irradiation is equal to the preset amount, said X-ray tube is inactivated by said main control circuit.

4,178,509

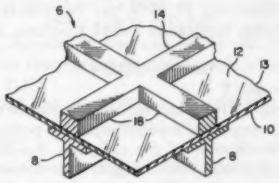
SENSITIVITY PROPORTIONAL COUNTER WINDOW

Keith A. More, and Donald R. Bianco, both of Ann Arbor, Mich., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 2, 1978, Ser. No. 911,733

Int. Cl.[2] G01T *1/18;* H01J *35/00*

U.S. Cl. 250—374 **6 Claims**



1. A window for a proportional counter used in an X-ray spectrometer, comprising:

a thin metallic foil having a high X-ray transmission capability for passing a relatively wide range of X-ray spectra;

the thin metallic foil having a thin plastic coating thereon which is essentially X-ray transparent;

the proportional counter including a housing having an open area; and

means supporting the thin plastic coated metallic foil and supported in the open area of the housing for providing a proportional counter window having a relatively large unobstructed window area.

4,178,510

DEVICE FOR MEASURING THE SPATIAL DISTRIBUTION OF RADIATION ABSORPTION IN A SLICE OF A BODY

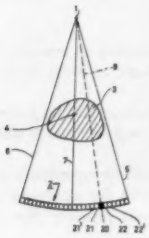
Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,039

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627885

Int. Cl.[2] A61B *6/02*

U.S. Cl. 250—445 T **35 Claims**



1. A device for measuring the spatial distribution of radiation absorption in a slice of a body, said device comprising a radiator for generating a fan-shaped radiation beam for irradiating the body, a row of adjacently arranged radiation detectors for determining measuring values concerning the radiation emerging from the body, the measurements being performed in a number of different angular positions of the radiator/detector system with respect to the body, the direction of the radiation beam extending in the slice of the body, and also comprising a reconstruction device for determining the absorption distribution in the slice on the basis of the measuring values obtained, characterized in that the device comprises a testing device for identifying defective detectors, and also an interpolation unit for replacement of measuring values of a detector which has been identified as being defective by correction values, formed by interpolation of measuring values measured along paths adjacent the paths along which the measuring values have been measured by the defective detector.

4,178,511

RADIOGRAPHY

Godfrey N. Hounsfield, Newark, and Richard M. Waltham, London, both of England, assignors to E M I Limited, Hayes, England

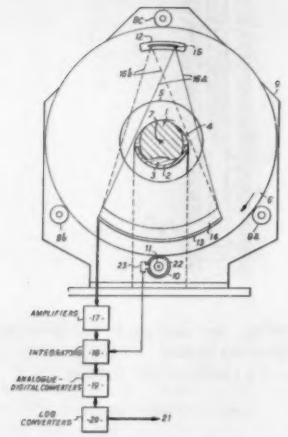
Filed Aug. 17, 1978, Ser. No. 934,311

Claims priority, application United Kingdom, Aug. 18, 1977, 34679/77

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **11 Claims**

1. Radiographic apparatus including a source of penetrating X-radiation arranged to irradiate a patient position with a flat fan-shaped distribution of the radiation, detector means arranged to receive radiation emergent from the patient position, the detector means including a plurality of detector devices reponsive to said x-radiation and extending across the said distribution, scanning means for causing the source and the detector means to move angularly around the patient position about an axis intersecting said position and extending substantially perpendicularly to the distribution of radiation, and further scanning means, synchronised in operation with the first-mentioned scanning means, to move the origin of said distribution of x-radiation, relative to the detector means, angularly in a sense opposite to that of the angular movement caused by said first-mentioned scanning means, the angular movement caused by said further scanning means being repetitive and at a rate higher than that caused by said first-mentioned scanning means; the synchronisation between the operations of the first-mentioned scanning means and the further scanning means causing a detector, during one cycle of the repetitive movement caused by said further scanning means, to provide output signals relating the a group of mutually inclined beam paths traversing said patient position, the group of paths for that detector intersecting, when extrapolated, at a pivot point disposed at a distance from said axis which exceeds the distance of the relevant detectors from said axis.



4,178,512

DEEPWATER IN-SITU FLUOROMETER

Frank Früngel, Hamburg, and Eberhard Gelbke, Uetersen, both of Fed. Rep. of Germany, assignors to Impulsphysik GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,847

Int. Cl.[2] G01N *21/38;* G01V *5/00*

U.S. Cl. 250—461 R **6 Claims**

1. An improved in-situ fluorometer for underwater use, the fluorometer being of the type comprising an underwater projector unit operative for emitting pulses of fluorescence-exciting radiation, a cooperating underwater receiver unit operative for receiving the resultant fluorescent radiation and generating a meterable output signal, an onboard power supply and metering unit, and an overboard connecting cable electrically connecting the onboard power supply and metering unit to the underwater units for transmission of operating power to the underwater units and for transmission of the meterable output signal to the onboard power supply and metering unit,

(a) the receiver unit comprising receiver circuit means, the projector unit comprising light-pulse-generating circuit means, the onboard power supply and metering unit comprising a constant-current source supplying operating power to the receiver circuit means and to the light-pulse-generating circuit means in the form of a constant current transmitted through said cable;

(b) the onboard power supply and metering units comprising a meter, the receiver circuit means generating in response to detected fluorescent radiation an output signal in the

form of a current and transmitting the output signal current to the meter through said cable,

whereby, due to the energization of the circuit means to the underwater units by an onboard constant-current source, and due to the generation by the receiver unit of a cable-transmitted signal in the form of a current, the length of the overboard cable is made uncritical,

(c) the receiver circuit means comprising:

a photodiode exposed to the fluorescent radiation resulting from the pulsed radiation from the projector unit,

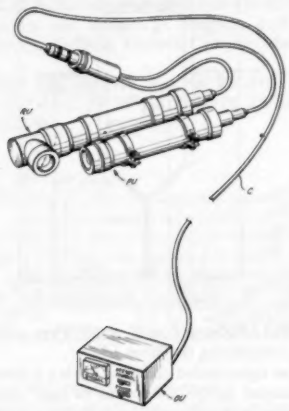
integrating means integrating the photodiode current to form an integrated photodiode-current signal,

peak-detecting means operative for determining and holding the peak value of the integrated photodiode-current signal, to form a held integrated photodiode-current peak-value persisting in the time beyond the peak value of the integrated photodiode current signal itself,

gating means, connected to the signal-transmission path intermediate the photodiode and the peak-detecting means for permitting and preventing signal transmission,

synchronizing means operative for rendering the gating means signal-transmissive for a brief time interval concurrent with the emission of a light pulse by the light-pulse-generating circuit means,

logarithmic amplifier means receiving the held integrated photodiode-current peak-value signal and deriving therefrom a logarithmized integrated photodiode-current peak-value signal,



sample-and-hold means operative for sampling and the holding the value of the logarithmized integrated photodiode-current peak-value signal, the sampling occurring subsequent to the signal-transmission interval of the gating means and subsequent to the peak-value determination by an interval sufficient to assure that the logarithmic amplifier means has fully responded to the held integrated photodiode-current peak-value signal, the signal held by the sample-and-hold means being in the form of a held voltage,

voltage-to-current converting means receiving a voltage derived from that held by the sample-and-hold means and producing a corresponding current constituting the output signal transmitted from the receiver unit through said cable to the onboard meter,

and automatic offset drift control means serving, during the time interval between the start of signal transmission by the gating means and the sampling by the sample-and-hold means, to counteract any offset and/or drift developed in the peak-detecting means and/or in the logarithmic amplifier means, by applying a balancing signal to the input of the peak-detecting means,

this automatic offset drift control means comprising means operative, intermediate successive pulse-measurement operations, for deriving the balancing signal by feeding back to the input of the peak-detecting means a signal derived from the output signal of the logarithmic amplifier means.

4,178,513

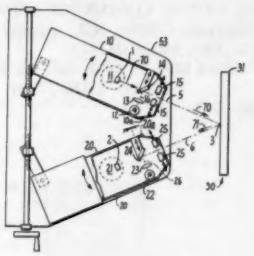
ART OBJECT ANALYZER

Jaques Dubois, deceased, late of Menlo Park, Calif., and Hans R. Zulliger, Portola Valley, Calif., assignors to Nuclear Semiconductor, Mountain View, Calif.

Filed Jan. 17, 1978, Ser. No. 870,143

Int. Cl.[2] H05G *1/62*

U.S. Cl. 250—491 **7 Claims**



1. A method of analyzing an object with a beam of ionizing radiation comprising the steps of:

(a) aligning an ionizing radiation-emitting generator, mounted in a generator housing, with an ionizing radiation detector, mounted in a detector housing, emitting a beam of visible light from a visible light source mounted in said generator housing and directing said beam of visible light with a generator beam directing means onto a point on said object, emitting a beam of visible light from a light source mounted in said detector housing and directing said beam of visible light with a detector beam directing means onto said same object point, and pivoting said generator and said detector with respect to each other in a common plane until said detector visible light beam coincides with said generator visible light beam on said object point;

(b) de-energizing said generator and said detector visible light sources and removing said generator and said detector beam directing means when said generator light beam coincides with said detector light beam;

(c) generating a beam of ionizing radiation from said generator and projecting said beam onto said object including said point of coincidence; and

(d) detecting a beams of ionizing radiation with said detector where said beam is emitted by said point of coincidence when said generator radiation beam contacts said point of coincidence.

4,178,514

SYSTEM FOR GENERATING A DYNAMIC FAR INFRARED IMAGE

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,205

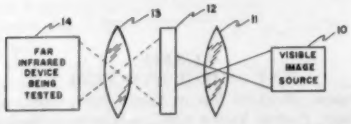
Int. Cl.[2] G01J *1/02*

U.S. Cl. 250—493 **9 Claims**

1. A system for converting a visible image to an infrared image including:

a visible-to-infrared transducer comprised of a thin thermally insulating film coated with a thin black coating, and means for directing a visible image onto said transducer;

wherein said film is chosen from one of the group comprising: cellulose nitrate, polyvinyl alcohol, paralene, poly-



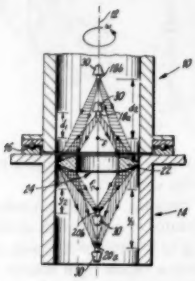
methyl metharcylate, vinyl formal copolymer, polyvinyl chloride, and aluminum oxide.

4,178,515

OPTICAL SIGNAL COMMUNICATING APPARATUS

Andrew Tarasevich, Califon, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed May 12, 1978, Ser. No. 905,545
Int. Cl.[2] G02B *27/00*
U.S. Cl. 250—551 **5 Claims**



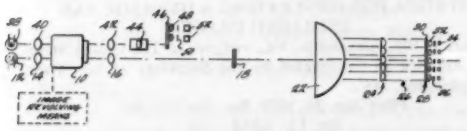
1. Apparatus for coupling data between first and second members undergoing relative rotation about an axis of rel ·tive rotation, said apparatus comprising at least one light-emitting means located on one of said members, at least one light-detecting means located on the other of said members, and a light-directing means carried by one of said members and effective to direct light from said light emitting means onto said light-detecting means, said light-emitting means and said light-detecting means being arranged in communicating pairs, spaced from one another along a common optical axis substantially coincident with said axis of relative rotation, and located at conjugate optical positions on opposite sides of said light-directing means, the optical center of said light-directing means lying on an axis substantially coincident with said axis of relative rotation.

4,178,516

MOLD READER

Richard D. Brugger, Erie, Pa., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 25, 1977, Ser. No. 854,894
Int. Cl.[2] G06K *7/10*
U.S. Cl. 250—566 **16 Claims**



1. Apparatus for reading a code character from a non-opaque object, comprising:

means for illuminating the region of said object bearing said character;

means, including a plurality of small diameter optical fibers disposed to receive an image from said character, for forming a plurality of code character images indicative of said character on a given plane;

an optical mask disposed in said second given plane, having thereon at least one character corresponding to each possible code character image, said mask characters being respectively aligned with said images and of opposite contrast to said images;

means for deriving respective signals indicative of the light passed through the respective ones of said mask characters; and

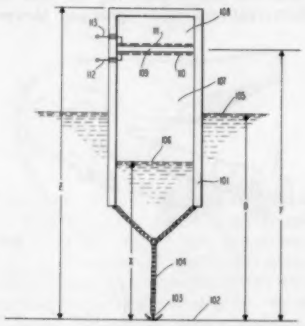
logic means, responsive to said derived signals, for generating signals indicative of the presence of individual ones of said possible code characters.

4,178,517

PROCESS FOR CONVERSION OF OCEAN WAVE ENERGY INTO ELECTRIC POWER AND APPARATUS

Robert E. Salomon, Dresher, and Susan M. Harding, Bala Cynwyd, both of Pa., assignors to Temple University

Filed Apr. 27, 1978, Ser. No. 900,668
Int. Cl.[2] F03B *13/10*
U.S. Cl. 290—53 **19 Claims**



1. A method of conversion of water-wave energy into electric power, comprising the steps of:

inserting an open-ended chamber having a protonic conductor mounted across the width of said chamber into an undulating body of water, said chamber being inserted to a sufficient depth such that the surface of said body of water defines a substantially gas-tight seal for the open end of said chamber;

evacuating the inside of said chamber;

filling the inside of said chamber with hydrogen gas; and

connecting a load electrically across said protonic conductor.

4,178,518

ELECTRONIC DIRECTIONAL CONTROL CIRCUIT

Weldon L. Phelps, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 29, 1978, Ser. No. 920,587
Int. Cl.[2] B60K *31/00*
U.S. Cl. 307—9 **9 Claims**

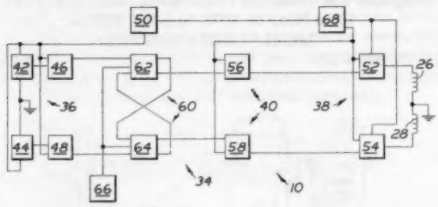
1. In a vehicle (10) having a forward switch (42) controllably energizing a forward solenoid (26) for propelling the vehicle (10) in the forward direction and a reverse switch (44) controllably energizing a reverse solenoid (28) for propelling the vehicle (10) in the reverse direction, the improvement comprising:

first means (38), for controllably energizing one of the forward and reverse solenoids (26,28) in response to receiving a command signal;

second means (40), for delaying operation of one of the forward and reverse solenoids (26,28) a preselected time

sufficient for the other of the forward and reverse solenoids (**26,28**) to deenergize;

third means (**60**), for storing the command signal and energizing the second means (**40**) in response to receiving the command signal; and



neutralizing means (**66**) for detecting the activation of both the forward and reverse switches (**42,44**) and preventing the operation of either of the forward and reverse solenoids (**26,28**) and maintaining the vehicle (**10**) in a neutral condition.

4,178,519

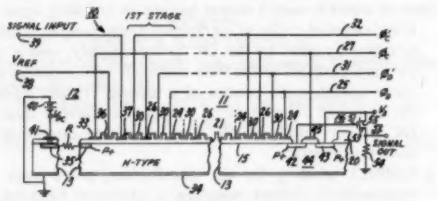
INPUT CIRCUIT FOR CHARGE TRANSFER APPARATUS

William E. Engeler, and Richard D. Baertsch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,011

Int. Cl.[2] **G11C** *19/28;* **H01L** *29/78, 27/02*

U.S. Cl. 307—221 D **6 Claims**



1. Charge transfer apparatus comprising

a semiconductor substrate of one conductivity type having a major surface,

a first electrode insulatingly overlying a first region of said substrate adjacent said major surface,

a second electrode insulatingly overlying a second region of said substrate adjacent said major surface and contiguous to said first region,

a third electrode insulatingly overlying a third region of said substrate adjacent said major surface and contiguous to said second region,

a fourth electrode insulatingly overlying a fourth region of said substrate adjacent said major surface and contiguous to said third region,

a fifth electrode insulatingly overlying a fifth region of said substrate adjacent said major surface and contiguous to said first region,

a region of opposite conductivity type in said major surface having a portion adjacent to said fifth region,

means for applying a reference voltage to said first electrode to establish a surface potential in said first region corresponding to said reference voltage,

means for applying a signal voltage to said second electrode to establish a surface potential in second region corresponding to said signal voltage,

means for applying a first clock voltage to said third electrode to establish a surface potential in said third region corresponding to said first clock voltage,

means for applying a second clock voltage to said fourth electrode to establish a surface potential in said fourth region corresponding to said second clock voltage,

said second clock voltage having a first value over a first portion of a cycle thereof which is unfavorable for the transfer of charge from said second region to said fourth region and having a second value over a second portion of said cycle which is favorable for the transfer of charge from said second region to said fourth region,

said first clock voltage having a first value during said first portion of said cycle of said second clock voltage which inhibits the transfer of charge from said second region to said fourth region and having a second value during said second portion of said cycle of said second clock voltage which enables the transfer of charge from said second region to said fourth region,

means for connecting said adjacent portion of said region of opposite conductivity type through a resistance to a source of potential unfavorable for the transfer of charge from said region of opposite conductivity type to said first region,

means for applying said second clock voltage to said fifth electrode to provide a surface potential in said fifth region and said adjacent portion of said region of opposite conductivity type during said first portion of said cycle of said second clock voltage energetically favorable for the flow of charge from said fifth region into said first region and to said second region and also for the flow of charge from said fifth region and said adjacent portion of said region of opposite conductivity through said resistance to said source of potential, and to provide a surface potential in said fifth region during said second portion of said cycle of said second clock voltage which is energetically favorable for the flow of charge carriers from said region of opposite conductivity type to said fifth region,

the time constant of the capacitance of said fifth electrode in relation to said substrate and said resistance being less than the duration of said first portion of said cycle of said second clock voltage whereby during an initial part of said first portion of said cycle of said second clock voltage sufficient charge flows to said second region to at least equilibrate the surface potential of said second region with said first region and during the remaining part of said first portion of said cycle of said second clock voltage excess charge flows into said adjacent portion of said region of opposite conductivity type,

whereby during said first portion of said second clock voltage a packet of charge is developed in said second region, the magnitude of which is dependent on the magnitude of separation in potential of said signal voltage from said reference voltage in the direction favorable to the transfer of charge from said first region to said second region, and during said second portion of said cycle of said second clock voltage said packet of charge is transferred from said second region to said fourth region.

4,178,520

BINARY FREQUENCY DIVIDER STAGES

Andreas Rusznyak, Chene-Bougeries, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Jun. 7, 1978, Ser. No. 913,378

Claims priority, application Switzerland, Jun. 8, 1977, 7041/77

Int. Cl.[2] **H03K** *23/30*

U.S. Cl. 307—255 C **1 Claim**

1. A binary frequency divider comprising:

an input terminal for receiving pulses, the frequency of which is to be divided;

an output terminal at which the divided frequency signals are to be delivered;

an electronic circuit comprising a plurality of insulated control electrode field effect transistors of the same type of conduction each having two secondary electrodes and a control electrode, and at least one storage capacitor

having two plates, the circuit being disposed between the input and output terminals;

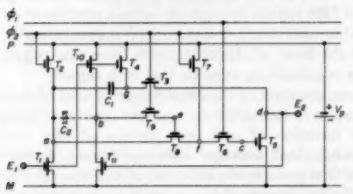
a first and a second supply line for said circuit, for connection to a source of direct current, said first line constituting the common point of said electronic circuit;

a first control line for said circuit, for receiving a first series of control pulses having a frequency equal to n times the frequency of the pulses to be divided, n being a positive whole number other than 0, and arranged to be fed in synchronism with the pulses to be divided; and

a second control line for said circuit, for receiving a second series of control pulses of the same frequency as the pulses of the first series, but in phase opposition thereto;

the first and second transistors of the plurality of transistors being connected in series via one of their secondary electrodes and being connected by their other secondary electrode to the first supply line in the case of the first transistor and to the second supply line in the case of the second transistor, the control electrode of the first transistor being connected to the input terminal and the control electrode of the second transistor being connected to the second control line;

the third and fourth transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the output terminal in the case of the third transistor and to the second supply line in the case of the fourth transistor, the control electrode of the third transistor being connected to the second control line and the control electrode of the fourth transistor being connected to the input terminal;



the storage capacitor being connected, via one of its plates, to the point of connection of the first transistor to the second transistor, and via its other plate to the point of connection of the third transistor to the fourth transistor;

the fifth transistor being connected via one of its secondary electrodes to the first supply line and via its other secondary electrode to the output terminal;

the sixth and seventh transistors of the plurality of transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the control electrode of the fifth transistor in the case of the sixth transistor and to the second supply line in the case of the seventh transistor, the control electrode of the sixth transistor being connected to the first control line and the control electrode of the seventh transistor being connected to the second control line;

the eighth transistor being connected via one of its secondary electrodes to the point of connection of the sixth transistor to the seventh transistor and via its other secondary electrode to the point of connection of the first transistor to the second transistor;

the ninth and tenth transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the control electrode of the eighth transistor in the case of the ninth transistor and to the second supply line in the case of the tenth transistor, the control electrode of the ninth transistor being connected to the second control line, and the control electrode of the tenth transitor being connected to the input terminal;

and the eleventh transistor being connected via one secondary electrode to the first supply line, via the other secondary electrode to the point of connection of the ninth transistor to the tenth transistor, and via its control electrode to the output terminal.

4,178,521

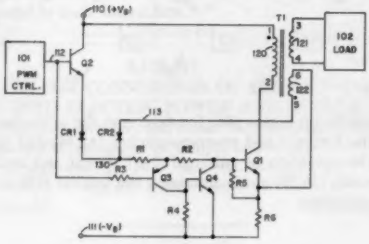
BASE DRIVE CIRCUIT

William R. Speth, Columbus, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,123

Int. Cl.[2] H03K *17/60, 1/00*

U.S. Cl. 307—270 **4 Claims**



1. In a power supply inverter circuit including a power transistor for intermittently coupling, via its collector-emitter circuit, a DC power supply to a primary winding of a transformer having a secondary winding coupled to a load circuit, means for controling the conduction state of the power transistor comprising;

pulse control means for furnishing at an output thereof turn-on and turn-off request signals,

turn-on control switch means having an enabling input terminal coupled to the pulse control means output, a second terminal coupled to the DC power supply, and a third terminal coupled to the base electrode of the power transistor operative on receipt of a turn-on request signal at the enabling input terminal to coupled current from the DC power supply to the base electrode circuit of the power transistor,

a feedback winding for the transformer, poled such that regenerative current coupling is provided between the transformer primary winding and the feedback winding, having a first terminal coupled to an emitter electrode of the power transistor and a second terminal coupled via a control diode to the base electrode circuit of the power transistor, the potential developed across the feedback winding upon initiation of power transistor turn-on being effective to render the turn-on control switch means nonconductive and to sustain power transistor conduction via the regenerative current coupling, and

turn-off control switch means having an enabling input coupled to the pulse control means output, operative on receipt of a turn-off request signal to divert drive current from the base electrode of the power transistor thereby initiating turn-off.

4,178,522

INFRARED DETECTION APPARATUS

Donald J. MacLennan, Ballston Lake, and Edwin E. Morris, Clinton, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,729

Int. Cl.[2] G01J *1/00*

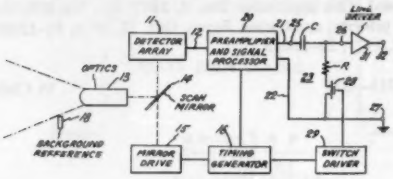
U.S. Cl. 250—338 **2 Claims**

1. Infrared detection apparatus for providing an output substantially free from background comprising

a signal channel of sequential input signals, each corresponding to a line of scan of a scene and a background reference, each signal including a sample corresponding to radiation

received from said background reference and a plurality of succeeding samples corresponding to radiation received from said scene,

circuit means for deriving a plurality of output signals, each corresponding to a respective one of said input signals in which the sample corresponding to said background reference is subtracted from each of the samples corresponding to said scene including an input terminal, an output terminal and a reference terminal, a capacitance connected between said input terminal and said output terminal, a resistance and a normally-open switch connected between said output terminal and said reference terminal,



means for applying the output of said signal channel between said input terminal and said reference terminal,

means for closing said normally-open switch during the time of occurrence of the sample of each input signal corresponding to said background reference,

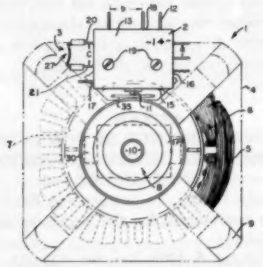
the reciprocal of the on-time of said switch being large in relation to the noise bandwidth of said sample corresponding to said background reference, the time constant of said capacitance and said resistance being greater than the on-time of said switch.

4,178,523

SWITCH JUMPER STRAP

Harold G. Lyerly, Paragould, Ark., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 24, 1978, Ser. No. 880,953
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—71 **5 Claims**



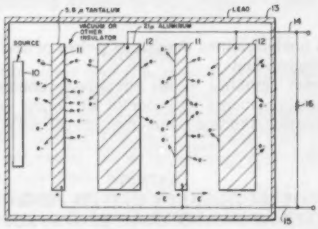
1. In a dynamoelectric machine employing a switch structure for electrically interconnecting said dynamoelectric machine to a source of electrical energy, said switch assembly including a plurality of accessible first electrical connector means, the improvement comprising jumper means for interconnecting various ones of said first connector means, said jumper means comprising a one piece, elongated strip of electrically conductive material having a first end and a second end, and a second electrical connector means integrally formed with said material strip at each end thereof, said second electrical connector means being positioned along the ends of said material strip at a right angle to said material strip, said material strip being deformed to adjust the spacing between the second electrical connector means, said second electrical connector means having a female type design complimentary to the design of said first electrical connector means so as to permit interconnection of said first and said second electrical connector means.

4,178,524

RADIOISOTOPE PHOTOELECTRIC GENERATOR

James C. Ritter, 13223 Ingleside Dr., Beltsville, Md. 20705

Continuation-in-part of Ser. No. 719,532, Sep. 1, 1976, abandoned. This application Jan. 10, 1978, Ser. No. 868,246
Int. Cl.[2] G21D *7/00*
U.S. Cl. 310—304 **15 Claims**



1. A radioisotope photoelectric generator which comprises:

a plurality of spaced first plates each of which is formed of a material with an atomic number greater than 46 with each of said first plates connected electrically to each other and having a thickness of less than one electron range at the maximum photon energy;

a plurality of spaced second plates each of which is formed of a material with an atomic number less than 23 with said second plates alternating with said first plates and connected electrically to each other with each of said second plates having a thickness of more than one electron range at the maximum photon source energy;

electrical insulation between each of said first and second plates, said insulation having a thickness of less than one electron range at the maximum energy of the photon source;

one or more grids inserted between each of said first and second plates;

means for applying a potential to each of said grids to suppress secondary electron emission; and

a photon—producing radioactive source of energy less than 1 MeV assembled relative to said first and second plurality of plates,

so that photons produced by said radioactive source interact preferentially with said first plurality of plates to eject electrons therefrom and transfer charge to said second plurality of plates thereby producing a potential between adjacent plates capable of sustaining a current in an electrical load.

4,178,525

TWO WIRE PIEZOELECTRIC ACCELERATION TRANSMITTER

Kenneth W. Barr, Brea, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 17, 1978, Ser. No. 878,739
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—319 **9 Claims**

1. A device for detecting and transmitting peak amplitudes of mechanical vibration which comprises:

(a) a piezoelectric crystal mechanical vibration to electrical voltage transducer and voltage preamplifier means;

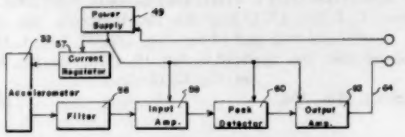
(b) a constant current generator to drive said preamplifier means;

(c) adjustable gain input amplifier means in circuit to receive the cyclic voltage signal from said transducer and generate an amplified signal therefrom;

(d) voltage peak detector means in circuit to receive said

amplified signal and to generate a pulsed voltage signal responsive to the peaks of said amplified signal;

(e) voltage peak summation means operatively connected to said peak detector means and to develop an analog output voltage signal responsive thereto after receipt and storage



of a predetermined number of pulses of said pulsed voltage signal; and

(f) output amplifier means operatively connected to said summation means to generate an output current signal proportional to said summed pulses of said voltage signal.

4,178,526

PIEZOELECTRICALLY DRIVEN TUNING FORK RESONATOR AND MOUNTING STRUCTURE

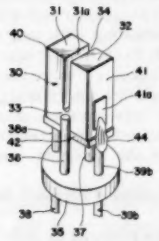
Takeshi Nakamura, Uji; Hiroshi Nishiyama, Muko; Yoshimasa Yamashita, Kameoka, and Yoshiko Kitayama, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed May 4, 1978, Ser. No. 902,819

Claims priority, application Japan, May 9, 1977, 52/59328[U]

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—321 **5 Claims**



1. A tuning fork resonator which comprises:

an electrically driven metallic tuning fork having a pair of spaced opposed tines and a common junction portion integrally connected at opposite ends with respective ends of the tines, said tuning fork further having a substantially U-shaped groove defined between the opposed tines;

an elastic insulating layer having electrically insulating and shock and vibration absorbing properties on the tuning fork;

at least one piezoelectric transducer layer applied to at least a portion of the surface of one of the tines which is remote from the U-shaped groove and extending to and contacting said insulating layer;

an electrode applied to the external surface of said transducer layer;

a support base;

a pair of support rods extending outwardly from the support base and supporting said tuning fork on the free end thereof;

at least one electrode terminal pin having the opposite end portions thereof on the opposite sides of said support base and a substantially intermediate portion extending completely through the thickness of said support base, the end portion of said terminal pin on the side of said support base on which said tuning fork is positioned engaging said elastic layer and supporting said tuning fork therethrough; and

a deposit of an electroconductive bonding agent connecting said electrode to said terminal pin and extending across the position where the transducer layer and the insulating layer are in contact, whereby the bonding agent is kept out of electrical contact with the metallic tuning fork.

4,178,527

QUARTZ CRYSTAL TUNING FORK VIBRATOR WITH UNEXCITED TINE CENTERS FOR REDUCED FLEXURAL AMPLITUDES

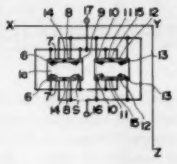
Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 844,827, Oct. 25, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,756

Claims priority, application Japan, Oct. 22, 1976, 51-126878; Mar. 22, 1977, 52-31422

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—370 **18 Claims**



1. A quartz crystal tuning fork vibrator comprising: a quartz crystal vibrator having a tuning fork shape including a pair of vibratable tines each having opposite major planar surfaces; and means for establishing alternating electric fields within said tines except in the vicinity of the tine central portions to thereby excite said tines into flexural vibration at lower amplitudes of vibration of the tine ends than would otherwise occur if the said electric fields were also established in the vicinity of said tine central portions, said means comprising four electrode segments disposed on at least one of said major planar surfaces of each tine and extending lengthwise therealong to define two inner electrode segments disposed between two outer electrode segments, means electrically connecting the two outer electrode segments of one tine with the two inner electrode segments of the other tine, and means electrically connecting the two inner electrode segments of said one tine with the two outer electrode segments of said other tine.

4,178,528

IMAGE INTENSIFIER UNITUBE FOR INTENSIFIED CHARGE TRANSFER DEVICE AND METHOD OF MANUFACTURE

Andrew J. Kennedy, Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,015

Int. Cl.[2] H01J *39/02, 39/14*

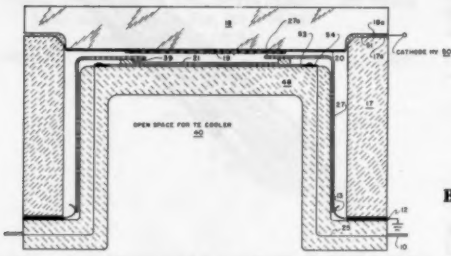
U.S. Cl. 313—102 **13 Claims**

13. In an image intensifier tube, a unitube device for intensified charge transfer device having said charge transfer device in proximity focus with the photocathode, the unitube device comprising:

a ceramic tube base having a cupped shaped inner centrally raised portion and an outer open space, said ceramic tube base having a plurality of internal conductors built therein extending from a plurality of mounting pads on the inner centrally raised portion to a plurality of external pins, said ceramic tube base further comprised of a charge transfer device having a plurality of beam leads therefrom whose ends are in electrical contact with said plurality of mounting pads and a metal shield placed over the inner area of said centrally raised portion extending from a smooth well rounded extended lip over the outer thick portion of said

charge transfer device down the inside walls of said ceramic tube base;

a generally cylindrical tube wall high temperature brazed to said ceramic tube base by a Kovar ring wherein said Kovar ring has an inner spring loaded electrical contact that is in electrical contact with said metal shield; and



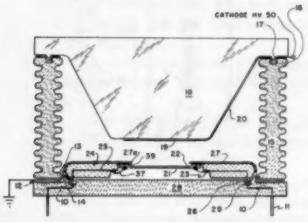
a cathode faceplate having a photocathode thereon in proximity focus with said charge transfer device, and cathode faceplate positioned with and vacuum sealed against said tube wall by a blunt edge type indium seal.

4,178,529

FLIP-HEADER AND TUBE BASE FOR CTD MOUNTING WITHIN AN IMAGE INTENSIFIER

Andrew J. Kennedy , Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,017
Int. Cl.[2] H01J *39/02, 5/50*
U.S. Cl. 313—102 **12 Claims**



1. In a modified image intensifier tube, a tube base support body and flip-header device with a semiconductor charge transfer device thereon in proximity focus with the photocathode, other overall device comprised of:

a ceramic tube base having a plurality of electrically conductive material wells that are electrically connected by built-in electrical leads to a plurality of output pins, said tube base brazed to a tube wall with an electrically grounded Kovar ring therebetween;

a flip-header comprised of a ceramic body having an array of built-in electrical conductors connected to a plurality of external electrical pins for insertion into said plurality of electrically conductive material wells and a conductive refractory metal plate over the outside of the ceramic body that is connected by a spring loaded electrical contact to said electrically grounded Kovar ring at one end and has a smooth well rounded extended lip out from the ceramic body on the other end that extends past an electrically grounded thick portion of a charge transfer device and over a portion of the thinned region wherein a plurality of electrical connecting wires are attached between the outputs of said charge transfer device and a plurality of bonding pads connected to said array of built-in electrical conductors; and

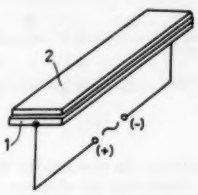
an input transparent faceplate having a photocathode positioned opposite said charge transfer device on said flip-header and a knife sealing edge that is inserted in an indium alloy filled concentric groove built in said tube wall for sealing the ultra high vacuum in said image intensifier tube wherein a cathode high voltage is connected through said indium filled alloy to said photocathode and wherein said extended lip of said conductive refractory metal plate bleeds stray charges from said photocathode and backscatter charges from said charge transfer device to allow higher operating voltage in said image intensifier tube.

4,178,530

ELECTRON TUBE WITH PYROLYTIC GRAPHITE HEATING ELEMENT

Bernhard Lersmacher, Aachen; Hans Lydtin, Stolberg; Horst Seifert, Hamburg, all of Fed. Rep. of Germany, and Johannes W. A. Krol, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1978, Ser. No. 923,495
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732960
Int. Cl.[2] H01J *1/22, 19/16*
U.S. Cl. 313—337 **5 Claims**



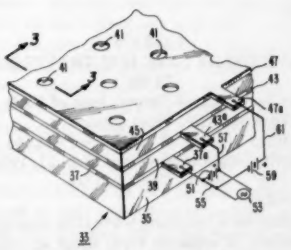
1. An electron tube comprising a thermionic cathode including a planar emissive body having an emissive surface and a heating element of pyrolytic graphite which is provided on the side of the emissive body remote from said emissive surface wherein the heating element is planar and the crystallographic c-axis of the pyrolytic graphite extends everywhere normal to the surface of the heating element facing the emissive body.

4,178,531

CRT WITH FIELD-EMISSION CATHODE

Roger C. Alig, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 15, 1977, Ser. No. 806,717
Int. Cl.[2] H01J *1/02, 29/48*
U.S. Cl. 313—409 **9 Claims**



1. A cathode-ray tube comprising an evacuated envelope having therein a target and an electron-beam-producing structure comprising

a plurality of spaced, pointed protuberances pointing in substantially the same direction,

each protuberance having associated therewith its own separate first electric-field-producing means for causing electric-field emission of electrons therefrom,

each protuberance also having associated therewith its own separate second electric-field-producing means for focusing the electrons emitted from said protuberance into a beam, said structure being adapted to project said beams along closely spaced substantially parallel paths to constitute a composite beam,

and further means along said paths for focusing said composite beam on said target.

4,178,532

ELECTRON GUNS FOR USE IN CATHODE RAY TUBES

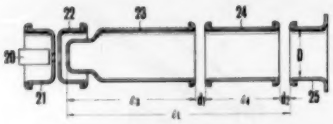
Kenichi Fukuzawa, Mobara; Kunio Ando, Yokohama, and Masakazu Fukushima, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,454

Claims priority, application Japan, Oct. 22, 1976, 51-126041

Int. Cl.[2] H01J *29/50*

U.S. Cl. 313—414 **7 Claims**



1. In a unipotential type electron gun for use in a cathode ray tube of the class comprising an electron emitting member which emits an electron beam of a controlled intensity under the control of an external control signal, a main electron lens adapted to focus said electron beam and constituted by three cylindrical electrodes disposed coaxially with predetermined gaps therebetween, wherein the same anode voltage is impressed upon the electrodes on both sides and a predetermined fixed focusing voltage is impressed upon an intermediate electrode, the improvement wherein the length of the intermediate electrode is set to be larger than 1.1 D, where D represents the inner diameter of said electrodes on both sides, and the sum of the length of one electrode located on the side of said electron emitting member, the length of said intermediate electrode, the gap length therebetween, the gap length between said intermediate electrode and the electrode on the opposite side is set to be within a range of from 4.0 D to 5.4 D.

4,178,533

MICROWAVE DELAY LINE FOR TRAVELLING WAVE TUBE

Pierre Ribout, and Bernard Delory, both of Paris, France, assignors to Thomson-CSF, Paris, France

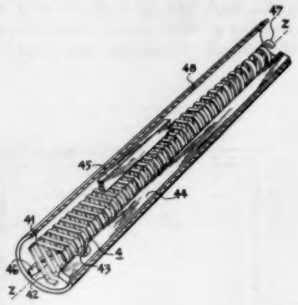
Filed Sep. 15, 1977, Ser. No. 833,646

Claims priority, application France, Sep. 21, 1976, 7628319

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.6 **9 Claims**

1. A delay line for a travelling wave tube, comprising a helix having a plurality of adjacent turns about an axis; several of said adjacent turns having on each turn at least three first zones spaced approximately equally from each other and at least three second zones interspaced with said first zones, said first and second zones of one turn being adjacent to the corresponding first and second zones on an adjacent turn, the distance between the axis and said first zones being constant and the



distance between the axis and said second zones varying from one turn to another.

4,178,534

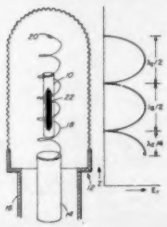
METHODS OF AND APPARATUS FOR ELECTRODELESS DISCHARGE EXCITATION

William H. McNeill, Carlisle; Joseph M. Lech, Westford; Paul O. Haugsjaa, Acton, and Robert J. Regan, Needham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 7, 1978, Ser. No. 922,625

Int. Cl.[2] H01J *7/46*

U.S. Cl. 315—39 **25 Claims**



1. An electromagnetic discharge apparatus comprising

(a) a source of power at a high frequency f, having a wavelength λ which is proportional to the free space wavelength λ_o;

(b) an electrodeless lamp having a generally cylindrical shaped envelope made of a light transmitting substance and a volatile fill material enclosed within the envelope, the fill material emitting light upon breakdown and excitation, said envelope having an internal length substantially one-half of said wavelength λ;

(c) a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end which couples power to the lamp and a second end which is coupled to the power source; and

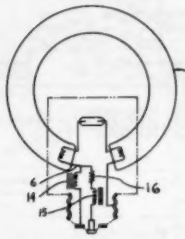
(d) conductive means having a first end thereof coupled to the first end of said inner conductor, and having a second end thereof open-circuited; the electrical length of said conductive means being said wavelength λ so that a voltage standing wave is presented on said conductive means with voltage maxima occurring at the ends and center of said conductive means, and axial electric field minima occurring at distances $\lambda/4$ from each of the two ends of said conductive means; said envelope being oriented centrally and axially within said conductive means so that an

axial, non-toroidal arc occurs within said envelope which does not attach to the interior walls of said envelope thereby enhancing the life of the electrodeless lamp.

4,178,535
THREE-WAY BRIGHTNESS FLUORESCENT LAMPHOLDER FITTING

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Sep. 21, 1978, Ser. No. 944,389
Int. Cl.² H01J *17/34*
U.S. Cl. 315—53 **8 Claims**



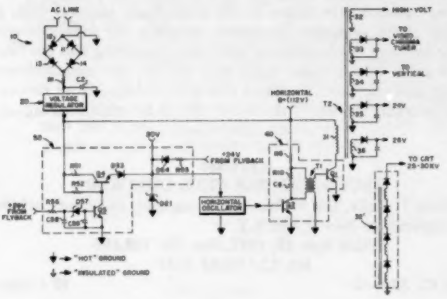
1. A fluorescent lampholder fitting comprising:
- a fluorescent lamp of preheat type having a first end provided with a starting filament including a first and second terminal wire, and a second end provided with a starting filament including a first and second terminal wire;
- a male screw base electrical connector adapted to fit a three-way socket lampholder, said screw base extending from a generally hollow housing which supports the lamp in at least two places and said screw base being provided with three electrical input connections; a screw shell connection, a center connection and an intermediate ring connection;
- a lamp starter connected between the first terminal wire of the first lamp end filament and the first terminal wire of the second lamp end filament;
- a conductor connecting the screw shell connection of the male screw base to the second terminal wire of the first lamp end filament;
- a first ballast means connected between the center connection of the male screw base and the second terminal wire of the second lamp end filament; and
- a second ballast means connected between the intermediate ring connection of the male screw base and the second terminal wire of the second lamp end filament.

4,178,536
DUAL-MODE HORIZONTAL OUTPUT STAGE

David E. Manners, Alexander, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 14, 1978, Ser. No. 933,219
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—408 **15 Claims**

1. A horizontal output stage for an Iso-Hot type television receiver, said output stage comprising:
- an output device having a first electrode coupled through a winding (31) of a flyback transformer to a source of voltage derived from the AC line and returned to a Hot ground and having a second electrode returned to the Hot ground;
- a switching device having a pole coupled to a third electrode of the output device, a control terminal coupled to a source of voltage derived from another winding (36) of the flyback transformer, and an NO terminal coupled to a horizontal interstage coupling means;
- bias means connected to an NC terminal of the switching device; and
- a feedback network connected to the NC terminal and coupled to winding 31, so that during startup the output device is connected to the NC terminal whereby it operates in an oscillatory mode and during steady-state it is

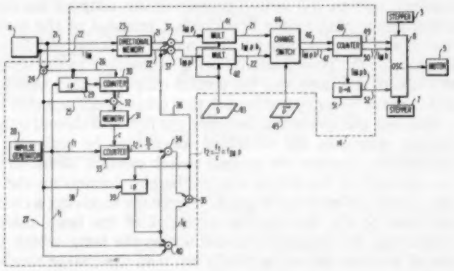


connected to the NO terminal whereby it operates in a substantially switching mode, driven by a signal developed by the horizontal oscillator.

4,178,537
SYSTEM FOR THE PRODUCTION OF AN ADDITIONAL ROTATIONAL MOTION OF A HELICALLY TOOTHED GEAR WORKPIECE IN A POSITIVELY CONTROLLED GEAR PROCESSING MACHINE

Arthur Angst, Wil, Switzerland, assignor to Reishauer AG, Zurich, Switzerland

Filed May 11, 1978, Ser. No. 904,969
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724664
Int. Cl.² G05B *19/28*
U.S. Cl. 318—603 **12 Claims**



1. In a method for the production of an additional rotational movement of a helically toothed gear workpiece in an electronically controlled positive movement gear hobbing machine, said machine having separate turning drives for the tool and the workpiece, wherein sequences of pulses dependent upon the rotation of each drive are supplied to a controller, said pulses being compared to each other for the production of a control signal for the readjustment of the workpiece drive, with an additional signal supplied that is derived from the longitudinal feed of the workpiece with respect to the tool, the improvement comprising; producing measurement pulses dependent upon the longitudinal feed of the workpiece, producing a constant number of intermediate pulses after the beginning of every interval limited by two successive measurement pulses in time-wise at least approximately even sequence, the distance between the intermediate pulses during said limited interval being determined by the measurement of the length of the previous interval and of an at least approximately even distribution of a certain number of intermediate pulses with respect to the measured interval length, and providing in each interval that is longer than the previous one, a pulse-free inter-

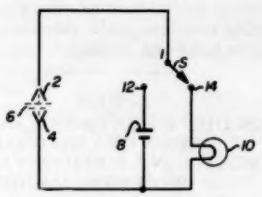
val section after the last of the intermediate pulses that have been produced with the specific number, and producing in each interval, which is shorter than the previous one, the excess intermediate pulses in the subsequent interval with a higher pulse sequence frequency between the measurement pulse forming the subsequent interval's beginning and the first subsequent intermediate pulse and in that the measurement pulses and intermediate pulses that are produced in all successive intervals are fed to the controller as an additional signal.

4,178,538

RECHARGEABLE CELL CHECKER

William T. Kelly, III, Wilton, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,600
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—2 **10 Claims**



1. A portable, self-contained rechargeable cell checker comprising a power source having first and second contact terminals; a lamp having first and second contact terminals; first and second output contact terminals adapted for accommodating a rechargeable cell therebetween; and switching means having first switch contact means connected to the first output contact terminal, and second switch contact means adapted for alternately connecting to the first contact terminal of the power source and the first contact terminal of the lamp; the second terminal of the power source being connected to the second terminal of the lamp and the second output contact terminal, said checker being operable such that when a rechargeable cell is disposed and connected between the first and second output contact terminals, the switching means can be activated to sequentially connect the second switch contact means to the first contact of the power source thereby connecting the rechargeable cell across the power source for receiving a charge and then to the first contact terminal of the lamp thereby connecting the rechargeable cell across the lamp which will reveal whether the rechargeable cell held the charge received from the power source.

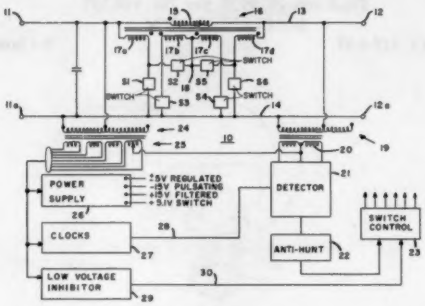
4,178,539

STEPPING AC LINE VOLTAGE REGULATOR

Roland L. Crapo, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Aug. 3, 1978, Ser. No. 930,763
Int. Cl.[2] G05F 1/30
U.S. Cl. 323—45 **12 Claims**

1. A stepping voltage regulator comprising a pair of input terminals connectable to a source of AC power, a pair of output terminals connectable to a load, a pair of lines connecting the two pair of terminals, a transformer having a secondary winding connected in series in one line and having four primary windings, a first primary winding being connected through a first switch from one line to the other line, a second primary winding being connected through a second switch from one line to the other line, a third primary winding having one end connected through a third switch to the end of the first winding, a fourth primary winding having one end connected through a fourth switch to the end of the second winding, said one end of the third and fourth windings having a common junction, a fifth switch connected between the other end of the third winding and the other line, a sixth switch connected between the other end of the fourth winding and the other line, each of said windings having the same number of turns, said first and third windings when energized inducing one direction of correcting voltage in the secondary winding and said second and fourth windings inducing the opposite direction of correcting voltage, switch control means for providing a conduction



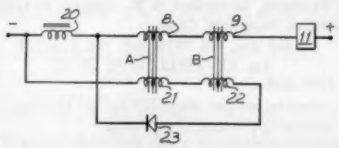
state of only one of either the first switch only or the third and fifth switches simultaneously or the fifth and sixth switches simultaneously or the fourth and sixth switches simultaneously or the second switch only, and detector means for sensing the value of the output voltage and providing a correcting signal to the switch control means to cause the switch control means to change to a different conduction state when the value of the output voltage exceeds a selected range of values.

4,178,540

SATURABLE REACTORS

Robert J. Logan, Sheffield, England, assignor to Inductive Controls Limited, Sheffield, England

Filed Mar. 20, 1978, Ser. No. 888,339
Claims priority, application United Kingdom, Mar. 22, 1977, 12131/77
Int. Cl.[2] G05F 1/32
U.S. Cl. 323—89 R **3 Claims**



1. A saturable reactor circuit comprising: a magnetic core; main and excitation windings for carrying a.c. load current and d.c. excitation current, respectively mounted on said core; an inductor connected in series with said excitation winding; a compensating winding mounted on said core, connected across said inductor and inductively coupled to said excitation winding, said compensating winding having the same number of turns as said excitation winding to apply across said inductor a voltage of opposite polarity to that in said excitation winding; and a diode in series with said compensating winding to inhibit the flow of the d.c. excitation current therethrough.

4,178,541

APPARATUS FOR TESTING THE OPERATION OF A DEVICE CONTROLLING THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

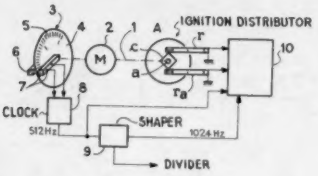
Gerard C. C. Brihier, Ollainville, France, assignor to Facom, Morangis, France

Filed May 31, 1978, Ser. No. 911,238

Claims priority, application France, Jun. 2, 1977, 77 16872; Jun. 2, 1977, 77 16873; Jun. 2, 1977, 77 16875

Int. Cl.[2] F02P *17/00*

U.S. Cl. 324—385 **26 Claims**



1. An apparatus for testing the operation of a device controlling the ignition of an internal combustion engine, such as an ignition distributor or an injection pump, and adapted to produce ignition initiating signals for said engine, comprising:

means for driving said device in rotation and simulating the drive thereof in normal operation;

an angular encoder mechanically coupled to the driving means, said encoder being capable of producing a train of clock pulses the frequency of which pulses is a function of the speed of rotation of said driving means, and capable of producing by revolution of said driving means a pair of successive locating pulses which are synchronized with the clock pulses;

means for producing from said ignition initiating signals initiating oulses representing said signals;

a measuring circuit for producing pulses the duration of which represents the evolution with respect to time of the occurrence of said ignition initiating signals in the course of each revolution of said driving means, said measuring circuit comprising:

means for establishing a first operational step and a second operational step of said measuring circuit, each of said operational steps respectively corresponding to a predetermined speed of said driving means;

memory means capable in the course of the first operational step of storing at least a pulse representing an ignition initiating signal immediately following on a second of said locating pulses;

output means for producing a measurement pulse constituting the relation with respect to time between said pulse stored in said memory means and the initiating pulse measured in the course of said second operational step;

and a display device connected to said measuring circuit for displaying a value representing the length of said measurement pulse.

4,178,542

MONITORING THE OPERATION STATUS OF AN ELECTRICAL COMPONENT ON THE BASIS OF AN INHERENT PULL UP OR PULL DOWN CHARACTERISTIC

Charles C. McCarthy, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,344

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—51 **2 Claims**

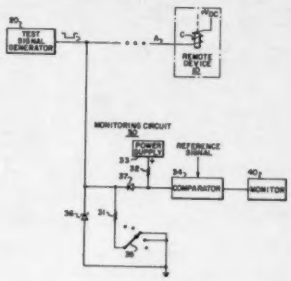
1. Apparatus for determining the operational status of an electronic or electrical component which exhibits either an inherent pull-up or pull-down characteristic comprising,

a test signal generating means including a single electrical lead connecting said test signal generating means to said electrical component, said test signal generating means applying a test signal to said electrical component via said electrical lead, and

monitoring circuit means connected to said electrical lead to monitor the response of said electrical component to said test signal, said monitoring circuit means including;

1. a comparator circuit having a first and second input, said first input being connected to said electrical lead,

2. a pull-up and a pull-down circuit means,



3. means for selectively connecting either said pull-up or pull-down circuit means depending on the pull-up or pull-down characteristic of said electrical component, to the first input of said comparator circuit means, a predetermined reference signal being supplied to the second input of said comparator circuit means,

said monitoring circuit means responding to said input by producing an output indication of the operational status of said electrical component.

4,178,543

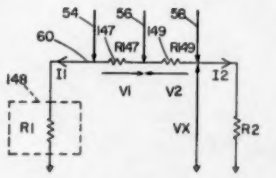
ANALYZING ELECTRICAL CIRCUIT BOARDS

Joseph F. Wrinn, North Quincy, and Mark S. Hoffman, Newton Center, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed Feb. 23, 1978, Ser. No. 880,589

Int. Cl.[2] G01R *27/14*

U.S. Cl. 324—64 **25 Claims**



1. In apparatus for analyzing electrical circuit boards by measuring the voltage drops due to test currents flowing in opposite directions along the straight portion of the conductive lead of an integrated circuit element mounted on a board, that improvement comprising:

A probe having at least three contact tips mounted to simultaneously contact three equally spaced points on said lead, said points being spaced apart sufficiently to permit measurement of electrical activity in each of the lead segments between adjacent pairs of said tips,

means for injecting an ac test signal through the tip nearest said element and for measuring the voltage drop between the two tips farthest therefrom due to test current flowing through one said lead segment, and

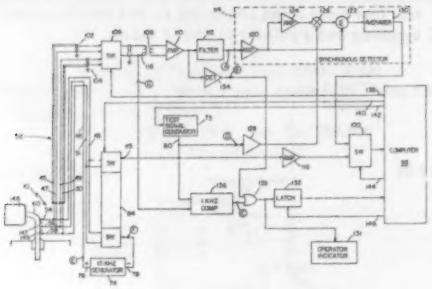
means for injecting a test signal through the tip farthest from said element and for measuring the voltage drop between the two tips nearest thereto due to test current flowing through the other said lead segment,

4,178,544

ELECTRICAL MEASUREMENT CIRCUITRY FOR LOW LEVEL AC SIGNALS

Mark S. Hoffman, Newton Center, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 24, 1978, Ser. No. 880,791
Int. Cl.[2] G01R *27/14*
U.S. Cl. 324—64 5 Claims



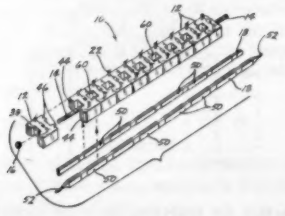
1. In electrical circuitry for measurement of low level ac signals during testing of an electrical element, comprising a three tip probe, and measurement circuitry connected to said probe to make successive voltage measurements between selected pairs of said tips while during each said measurement an ac test signal is injected into said element through the tip not in the then-selected pair, that improvement wherein the output cable from said probe to said measurement circuitry comprises four wires arranged in two twisted pairs, one said tip is connected to a said wire in each said twisted pair, and the other two said tips are respectively connected to the remaining two said wires.

4,178,545

ELECTRICAL RESISTOR TESTING FIXTURE

Jerome J. Kneifel, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed May 9, 1977, Ser. No. 795,137
Int. Cl.[2] G01R *31/00*
U.S. Cl. 324—158 F 9 Claims



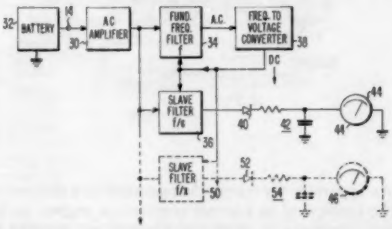
1. A modular electrical component test tray comprising,
a plurality of individual modules,
each said individual module having
an electrically insulative body structure with top and bottom surfaces,
means for supporting an electrical component at a position above said top surface, said means for supporting being attached to said body structure,
air flow channel means for guiding air flow to an area adjacent said position of an electrical component in non-direct impinging relation to said position, said air flow channel means comprising at least one air passageway through said body structure, said air passageway having inlet and outlet ends with said outlet end disposed in said top surface transversely remote from said position of an electrical component, said air passageway being in non-alignment with said position,
means for selectively detachably securing said individual modules together, and
means for electrically connecting the electrical components supported by each said individual modules to test equipment.

4,178,546

ALTERNATOR TEST APPARATUS AND METHOD

Leonard R. Hulls, Marblehead, and Toy Dowdell, Jr., Acton, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,510
Int. Cl.[2] G01R *31/00*; G08B *21/00*
U.S. Cl. 324—158 MG 7 Claims



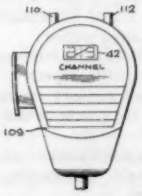
1. A method for testing a variable speed alternator having output winding means, and rectifier means connected to said output winding means for rectifying the alternating voltage produced at said winding means to obtain a direct current output having a variable ripple frequency component at a variable frequency f, said rectifier means including a plurality of diodes, for the failure of one of said diodes, comprising the step of:
tracking the frequency of and measuring the amplitude of a particular subharmonic of said variable frequency f, said amplitude, when it exceeds a given value, being indicative of a failed diode.

4,178,547

REMOTE MICROPHONE WITH APPROVED CHANNEL SELECTOR

Miguel E. Santana, 1050 Monte Verde Dr., Arcadia, Calif. 91006

Filed Sep. 22, 1976, Ser. No. 725,496
Int. Cl.[2] H01B *1/38*
U.S. Cl. 325—16 9 Claims

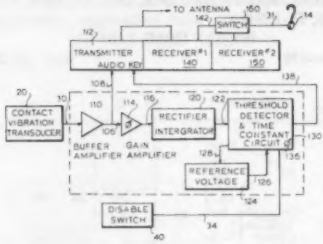


1. A remote microphone unit for use with a transceiver apparatus, said remote microphone unit comprising:
first and second switching means for selecting a desired channel from a plurality of available transmission channels, activation of said first and second switching means generating signals representing the selected channel,
an electronic digital display for displaying the selected channels, and
means responsive to said generated electrical signals for generating the channel selected in electronic digital form to said electronic digital display, wherein
said digital display contains at least first and second indicators, said first indicator indicating the unit digit of a two digit channel and said second indicator indicating the tens digit of said channel, said units digit display being controlled by said first switching means and said tens unit display being controlled by said second switching means.

4,178,548
VOICE ACTUATED MOBILE RADIO

James G. Thompson, 101 Diane Cir., Indialantic, Fla. 32903, assignor to Geraldine E. Thompson and James G. Thompson, both of Indialantic, Fla.

Filed Oct. 4, 1976, Ser. No. 729,163
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—16 3 Claims



1. An interface apparatus for controlling the operation of a communications transmitter/receiver type radio, said interface apparatus comprising in combination;

a capacitance type contact vibration transducer responsive to vibrations in the frequency range of at least 500 to 2,000 Hz, coupled to the throat area of the communicator for generating a transmit audio signal being coupled to a modulator section of said communications transmitter/-receiver for modulating the transmitter output;

voice operated switching means for switching the transmitter/receiver into and out of the transmit mode responsive to receiving said transmit audio signal from said contact vibration transducer, whereby the operation of and the transmit signal from the transmitter/receiver type radio will be relatively impervious to the high ambient noise level;

remote disabling means for generating a disable signal coupled to said voice operated switching means for disabling said voice operated switching means from switching said transmitter/receiver into said transmit mode;

means, coupled to said contact vibration transducer, for generating a keying signal responsive to receiving said transmit audio signal therefrom with said keying signal generating means continuing to generate said keying signal for a predetermined period of time after the loss of said transmit audio signal; and

keying means coupled to said keying signal generating means for switching the transmitter/receiver into the transmit mode responsive to receiving said keying signal, and for switching the transmitter/receiver into the receive mode responsive to one of the loss of said keying signal and receiving said disable signal from said disabling means.

4,178,549
RECOGNITION OF A RECEIVED SIGNAL AS BEING FROM A PARTICULAR TRANSMITTER

Gregory W. Ledenbach, San Jose, and Dennis E. Morris, Saratoga, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 27, 1978, Ser. No. 890,464
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—38 R 18 Claims

1. A system for recognizing a received encoded signal as being from a particular transmitter, comprising

an encoder for encoding a signal to have a predetermined sequence of pulses of different predetermined durations within a constant bit interval in accordance with a selected code; wherein each of the different predetermined durations corresponds to a different bit;

a transmitter for transmitting the encoded signal;

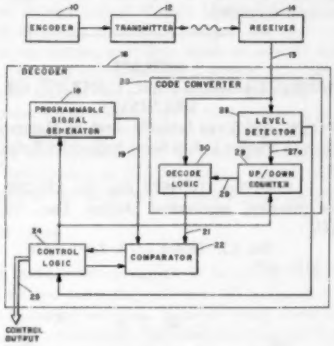
a receiver for receiving the transmitted encoded signal; and

a decoder for recognizing the received encoded signal as being from the transmitter, comprising

a programmable digital logic signal generator that is programmed in accordance with the selected code for generating a programmed digital logic signal having a predetermined sequence of different digital words corresponding to the predetermined sequence of pulses of different predetermined durations in the transmitted encoded signal;

a code converter for converting the received encoded signal to a decoded digital logic signal in accordance with the selected code;

a comparator for comparing the decoded digital logic signal with the programmed digital logic signal; and



a control logic circuit coupled to the programmable signal generator, the code converter and the comparator for synchronizing the programmed digital logic signal with the decoded digital logic signal and for recognizing the received encoded signal as being from the transmitter when said comparison indicates a predetermined number and sequence of valid comparisons between the decoded digital logic signal and the programmed digital logic signal;

characterized by the code converter comprising means for measuring and comparing the relative durations of the pulse and the non-pulse time during each bit interval, and for providing a decoded digital logic signal having digital words corresponding to one or another of the predetermined durations in accordance with said comparison of the relative durations.

4,178,550
METHOD AND APPARATUS TO PERMIT SUBSTANTIAL CANCELLATION OF INTERFERENCE BETWEEN A RECEIVED FIRST AND SECOND SIGNAL

Anthony Acampora, Freehold; Douglas O. J. Reudink, Sea Grit, and Yu S. Yeh, Freehold Township, Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

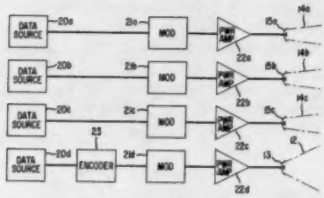
Filed Jun. 3, 1977, Ser. No. 803,152
Int. Cl.[2] H04J 13/00; H04B 3/60, 15/00
U.S. Cl. 325—41 13 Claims

9. A transmitter comprising

a first transmission section including means for modulating a first input digital information signal to a predetermined frequency spectrum;

a second transmission section including means capable of both encoding a second input digital information signal having a different informational content and a lower information transmission capacity than said first digital information signal using a forward error correcting code and

modulating the second digital information signal to said predetermined frequency spectrum; and



means for concurrently transmitting each of the digitally modulated first information signal and the encoded and digitally modulated second information signal in a predetermined direction.

4,178,551

BANDWIDTH SWITCHING CIRCUITS OF RADIO RECEIVER

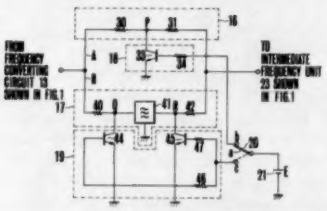
Minoru Ogita, and Yuzo Ishigaki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 10, 1977, Ser. No. 850,310

Claims priority, application Japan, Dec. 14, 1976, 51-166694[U]

Int. Cl.[2] H04B *1/16, 1/06, 1/16*

U.S. Cl. 325—427 **1 Claim**



1. In an intermediate frequency stage of a bandwidth switching circuit of a radio receiver wherein an intermediate frequency signal may selectively pass through either one of two parallel branched signal paths, the improvement wherein the selection of said branched signal paths is effected by a switching operation of a transfer switch which includes two stationary contacts and a movable contact, and wherein one of said parallel branched paths comprises a first intermediate frequency circuit constituted by first and second resistors connected in series, a first three-terminal switching element constituted by a first transistor and a third resistor, the first transistor having a collector-emitter current path with one end grounded, the other end connected to the juncture between said first and second resistors, and its base electrode connected to one stationary contact of said transfer switch through our third resistor, and wherein the other of said parallel branched paths comprises a fourth resistor, an intermediate frequency filter and a fifth resistor which are connected in series, a second three terminal switching element constituted by second and third transistors and sixth and seventh resistors, one output electrode of said second transistor being connected to the juncture between the fourth resistor and the intermediate frequency filter, one output electrode of said third transistor being connected to the juncture between the intermediate frequency filter and the fifth resistor, the other output electrodes of both said second and third transistors being grounded, input electrodes of said second and third transistors being connected in common to the other stationary contact of said transfer switch through said sixth and seventh resistors, respectively, and wherein the movable contact of said transfer switch is connected to one terminal of a single d.c. voltage source, the other terminal of said source being grounded.

4,178,552

NOISE ELIMINATING CIRCUIT

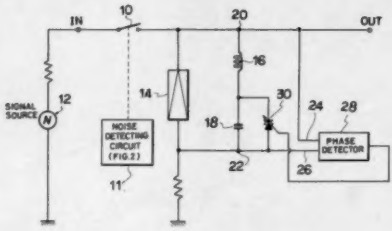
Kiyoshi Amazawa, and Masaharu Mori, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,549

Claims priority, application Japan, Dec. 28, 1976, 51-158405; Dec. 28, 1976, 51-158406

Int. Cl.[2] H04B *1/10*

U.S. Cl. 325—479 **5 Claims**



1. A noise eliminating circuit for an AM receiver including RF and IF stages and wherein a pulsed noise component included in an amplitude modulated wave signal is eliminated by making the RF or IF stage of the receiver an open circuit, while at the same time, compensating for the carrier components of the incoming signal that are blocked during the open circuit condition of the stage, said circuit comprising:

(i) noise detecting means for detecting said noise component and responsive thereto for generating a control signal;

(ii) switch means responsive to said control signal of said noise detecting means for blocking passage of the amplitude modulated wave signal through said stage; and

(iii) signal producing means responsive to the carrier component of said amplitude modulated wave signal passing through said stage just before the signal is blocked for duplicating said carrier component during such signal blockage.

4,178,553

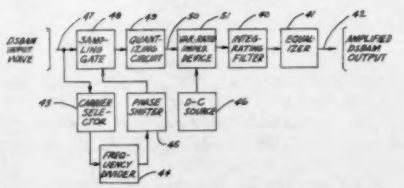
SAMPLING MODULATED WAVES

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison, Montreal, Quebec, Canada (H3P 3C6)

Filed Nov. 30, 1978, Ser. No. 964,832

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—487 **9 Claims**



1. The method of processing a carrier double-sideband amplitude modulated by a message which comprises:

sampling said modulated carrier at instants which occur at a frequency which is between twice and four times the highest frequency of said message, said instants not all occurring at zero crossings of said carrier, said sampling frequency being equal to twice the carrier frequency divided by an integer, to produce a sequence of samples, and

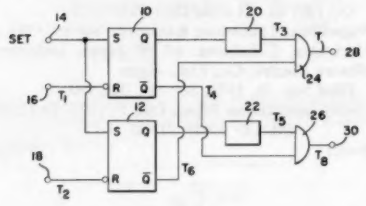
integrating said sequence of samples in a filter to produce an output wave containing the information of the message.

4,178,554

PHASE DIFFERENCE DETECTOR

Takashi Sase, Hitachi; Kazuo Katoh, Tokai, and Takeshi Hirayama, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 25, 1977, Ser. No. 844,989
Claims priority, application Japan, Oct. 25, 1976, 51-128613
Int. Cl.[2] H03K *5/20, 3/86*
U.S. Cl. 328—133 **5 Claims**



1. A phase detector comprising:

first and second input signal sources providing first and second input signals both of which signals rise at the same time;

a first bistable element having first and second output states coupled to the first input signal source wherein said first bistable element is switched from said first state to said second state at the leading edge of said first input signal;

first means for delaying said second state output signal of said first bistable element by a first predetermined time;

a second bistable element having first and second output states and coupled to the second signal source wherein said second bistable element is switched from said first state to said second state at the leading edge of said second input signal; and

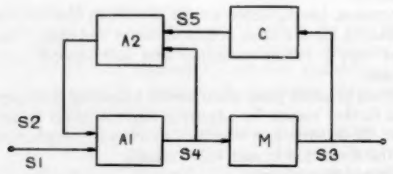
second means for producing an output pulse at the coincidence of said first-state output of the second bistable element when said second bistable element reswitches from said second state back to said first state at the trailing edge of said second input signal and the output of said first means which is delayed by the first predetermined time, the pulse length of said second means output pulse being determined by the trailing edge of said delayed output signal of said first means.

4,178,555

METHOD OF REDUCING DISTORTION IN ELECTRONIC NETWORKS

Vladan Temer, 1400 Fountain Grove Pkwy., Santa Rosa, Calif. 95404

Filed Mar. 31, 1978, Ser. No. 892,031
Int. Cl.[2] H03B *1/04*
U.S. Cl. 328—162 **6 Claims**



1. A method for the processing of electrical signals by means of an electronic system which comprises:

a. a first summing network having a first and a second input and an output, the input signal to the system being applied to said first input of first summing network, a correction signal being applied to said second input of first summing network and the output signal of said first summing network being determined in the frequency domain by the equation

$$S4 = P \cdot S1 + Q \cdot S2$$

with S4 being said output signal of first summing network, S1 being said input signal to the system, S2 being said correction signal and P and Q being linear transfer functions;

b. a main channel having an input and an output, said input to main channel being connected to said output of first summing network and said output of main channel being the output of said system;

c. a control network having an input , an output, and a transfer function C, said input to control network being connected to said output of main channel; and

d. a second summing network having a first and a second input and an output, said first input to second summing network being connected to said output of control network, said second input to second summing network being connected to said output of first summing network, the signal at said output of second summing network being applied to said second input of first summing network, thereby functioning as said correction signal, and being determined in the frequency domain by the equation

$$S2 = T \cdot S5 + R \cdot S4$$

with S2 being said correction signal, S5 being the signal at said first input to second summing network, S4 being said output signal of first summing network, T and R being linear transfer functions, and the relationship between said transfer functions R and Q being, in the frequency domain,

$$R \cdot Q = 1$$

so as to achieve for said system an overall transfer function F which is independent of the transfer characteristics of said main channel and is determined in the frequency domain by the equation

$$F = S3/S1 = -R \cdot P/T \cdot C$$

with S3 being the signal at said output of system, S1 being said input signal to the system, R, P, and T being said linear transfer functions, and C being said transfer function of control network and being equal in frequency domain to the ratio of said signal at output of control network to said signal at input of control network.

4,178,556

CLASS D AMPLIFIER SYSTEM

Brian E. Attwood, Sestri 49, Smithbarn Horsham, Sussex RH13 6DS, England

Filed Apr. 19, 1978, Ser. No. 897,699
Claims priority, application Japan, Apr. 22, 1977, 52/50399[U]
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—10 **4 Claims**

1. A Class D amplifier system comprising:

an audio amplifier for amplifying an audio signal;

a carrier signal source;

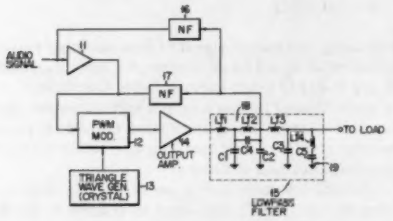
a pulse width modulator for pulse width modulating a carrier signal from said carrier signal source by an output signal of said audio amplifier;

means connecting the output of said audio amplifier and the output of said carrier signal source to said pulse width modulator as inputs;

an output amplifier having an input connected to the output of said pulse width modulator for amplifying a pulse width modulated signal;

a low pass filter having an input connected to the output of said output amplifier to apply a recovered audio signal to a load;

a trap circuit arranged in said lowpass filter to resonate at a carrier signal frequency; and



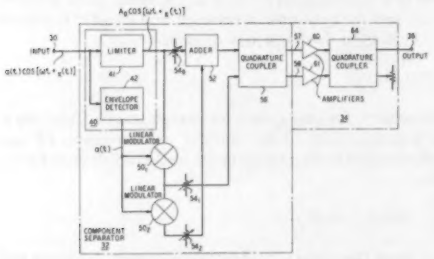
negative feed-back circuit means connecting an output voltage from said trap circuit as input to said pulse width modulator.

4,178,557

LINEAR AMPLIFICATION WITH NONLINEAR DEVICES

Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1978, Ser. No. 969,774
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—10 **5 Claims**



1. A circuit for linearly amplifying a bandpass input signal having amplitude and phase variations comprising:

a component separator comprising means for generating from the input signal a first signal representative of an amplitude limited version of the input signal and a second signal representative of the amplitude envelope of the input signal and a phase modulator connected to said first and second signal generating means, the component separator producing a first and a second output signal which are substantially constant in amplitude;

a first and a second amplifier coupled to enable reception and amplification of the first and second output signal, respectively, from the component separator; and

a coupler capable of combining the two amplified signals to produce a restructured replica of the bandpass input signal

CHARACTERIZED IN THAT

the phase modulator comprises

a first and second linear suppressed-carrier amplitude modulator with each modulator comprising a first and a second input terminal and an output terminal, the first and second modulators being connected in a cascade arrangement with the output of the first modulator connected to the first input of the second modulator and the first terminal of the first modulator and the second terminals of both modulators being connected to receive the first and second signals, respectively, from said generating means;

adding means having input terminals thereof connected to receive the first signal from the generating means and the output from the second linear modulator;

a quadrature coupler capable of combining in quadrature the output signals from said adding means and the output from said first linear modulator; and

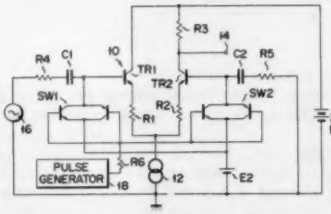
a first and a second weighting means disposed between the outputs of the first and second linear modulator and the inputs to the quadrature coupler and adding means, respectively, each weighting means being capable of introducing a separate predetermined weighting factor to the signal passing therethrough.

4,178,558

DC LEVEL CLAMPING CIRCUIT

Yoshitake Nagashima, Yokohama; Kazumasa Noyori, Oita, and Hideki Moriyama, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Sep. 26, 1978, Ser. No. 945,850
Claims priority, application Japan, Oct. 5, 1977, 52-119059
Int. Cl.[2] H03F *21/00*
U.S. Cl. 330—11 **6 Claims**



1. A DC level clamping circuit comprising a signal input terminal, a DC power source terminal, a reference power source terminal, a differential amplifier circuit having first and second input terminals, a first capacitor coupled between the signal input terminal and the first input terminal of the differential amplifier circuit, a second capacitor coupled between the reference power source terminal and the second input terminal of the differential amplifier circuit, first and second switching means coupled between the DC power source terminal and the first input terminal of the differential amplifier circuit and between the DC power source terminal and the second input terminal of the differential amplifier circuit, respectively, and control means for controlling the conductive state of the first and second switching means.

4,178,559

AMPLIFIER DISTORTION REDUCTION APPARATUS

Richard A. Nichols, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 11, 1978, Ser. No. 941,521
Int. Cl.[2] H03F *1/32*
U.S. Cl. 330—296 **3 Claims**

2. Distortion reduction circuit apparatus comprising, in combination:

valve means, having determinable distortion characteristics, including input means, common means and output means;

power supply means including first and second terminal means;

distortion product generation means including diode means and further means for adjusting current levels therein so that the distortion in said diode means is complementary to the distortion in said valve means;

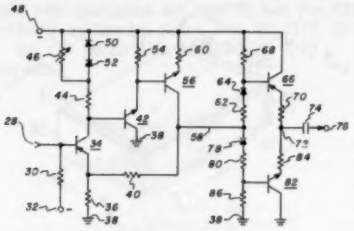
load impedance means;

means connecting said distortion product generation means and said load impedance means in series between said output means of said valve means and said first terminal means of said power supply means;

further means connecting said common means of said valve

means to said second terminal means of said power supply means;

signal means for supplying input signals to be amplified to said input means of said valve means; and



final means, connected to said output means of said valve means for supplying substantially distortion-free amplified output signals.

4,178,560

PHASE COMPARATOR ARRANGEMENT FOR CONTROLLING AN ELECTRICAL MEMBER

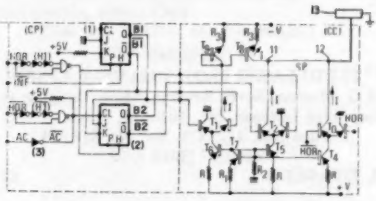
Christian Maury, Velizy, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 1, 1978, Ser. No. 874,053

Claims priority, application France, Feb. 7, 1977, 77 03315

Int. Cl.[2] H03B *3/04;* H03K *5/20*

U.S. Cl. 331—1 A **17 Claims**



12. A phase comparator circuit arrangement having a lock-on phase and a control phase for developing a control signal for controlling an electrical load member wherein said control phase follows said lock-on phase, comprising the combination of:

first input means for receiving a first two-level waveform derived from the output of said electrical load member, said first waveform being periodic and having a constant cyclic ratio after having locked on a reference signal,

second input means for receiving a second two-level waveform which serves as the said reference signal during the lock-on phase and becomes non-periodic with a variable cyclic ratio after said first wave-form has locked-on the said second waveform,

circuit means for comparing the phases of the said first and second waveforms, said circuit means comprising a first bistable flip-flop member having first and second gating inputs, connected, respectively, to outputs of the said first and second input means,

means for deriving first and second complementary voltages from complementary outputs of the said first bistable flip-flop member and applying said voltages to enable the said first and second gating inputs, and,

means for subtracting an output waveform from said first bistable flip-flop member from said first waveform to develop a three-level control signal responsive to the phase difference between said first and second waveforms.

4,178,561

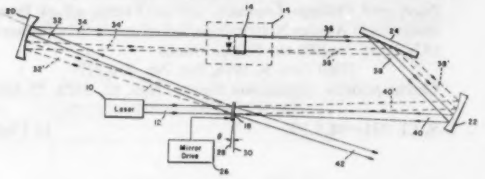
SCANNING ARRANGEMENTS FOR OPTICAL FREQUENCY CONVERTERS

David T. Hon, Los Angeles; Hans W. Bruesselbach, Santa Monica; Alexander R. Muir, Playa Del Rey, and Harold J. Tuchnyer, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 2, 1978, Ser. No. 947,915

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.6 **12 Claims**



1. An optical frequency converting arrangement comprising:

an optical signal converting medium having an input surface and output surface for developing from a light beam at a first frequency incident upon said input surface a light beam at a second frequency emerging from said output surface;

means for directing an input light beam at said first frequency toward said input surface of said medium while causing said beam to converge to a portion of reduced cross-section at said medium; and

means for producing relative movement between said reduced cross-section portion of said beam and said medium such that said portion of said beam is caused to effectively reciprocatively scan said input surface of said medium while deriving from said light beam emerging from said output surface of said medium an output light beam at said second frequency along a stationary path.

4,178,562

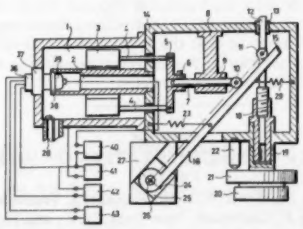
CAVITY RESONATORS WITH FREQUENCY-LINEAR TUNING

Imre Torma; Maria Temesi nee Palmai; Sándor Földes, and József Dorogi, all of Budapest, Hungary, assignors to Távközlési Kutató Intézet, Budapest, Hungary

Filed Jan. 10, 1977, Ser. No. 757,868

Int. Cl.[2] H03B *9/06;* H01P *7/04, 7/06*

U.S. Cl. 331—84 **22 Claims**



1. A cavity resonator with straight-line frequency tuning, operating in a TEM basic waveform, comprising: at least one tuning element connected to a cavity of the resonator and including at least one first structural element that insures linear guidance and is displaceable along a straight forced trajectory; said tuning element being in a forced coupling with a straight guide path that is formed on a second structural element that is swingable about a rotational axis that is perpendicular to the direction of straight movement of said tuning element, said tuning element being provided with a first roller that bears

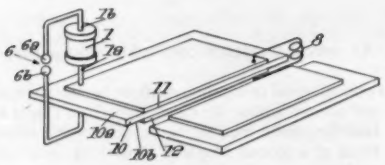
against said guide path; and a frequency-linear adjusting organ displaceable along another straight forced trajectory and being provided with a second roller that also bears against said guide path.

4,178,563

SYSTEM FOR GENERATING A HIGH-ENERGY ELECTRICAL SIGNAL THROUGH A BRIEF TIME, AND A LASER COMPRISING SUCH A SYSTEM

Philippe Huet, Gif-sur-Yvette; Roger H. Milléon, Levis-Saint-Nom, and Philippe Leprince, Gif-sur-Yvette, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 9, 1976, Ser. No. 740,217
Claims priority, application France, Nov. 17, 1975, 75 35084
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 PE **12 Claims**



1. A system for generating and transferring to a load an electrical pulse signal of high energy and low duration, comprising a voltage source, capacitor means for the storage of high voltage energy connected across said voltage source, and interposed between said voltage source and said load, an electronic switch for controlling the discharge of said capacitor connected in series with a flat line energy transfer means comprising an insulating sheet having on each side thereof a metal coating provided with an output terminal, said output terminals being connected respectively across said load, said flat line transfer means having an aperture therethrough, and said high energy storage capacitor means comprising a plurality of capacitors of the discrete type, each having first and second plates, said capacitors being disposed on one side of said transfer means in a parallel array around the said aperture, a first metal contact ring disposed coaxially with said aperture in contact with said first plates and the metal coating on the one side of said transfer means and a second metal contact ring interconnecting said second plates, and a metal contact base disposed on the metal coating on the other side of the transfer means symmetrically around the aperture, and said electronic switch comprises a first and a second electrode spaced from each other to define a spark gap, the first and second electrodes being connected respectively to the second metal ring and said metal contact bases so that the longitudinal axis of the electrodes of the spark gap corresponds substantially to the axis of the aperture of the insulating sheet.

4,178,564

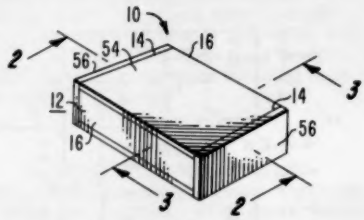
HALF WAVE PROTECTION LAYERS ON INJECTION LASERS

Ivan Ladany, Stockton; Michael Ettenberg, Freehold, both of N.J.; Harry F. Lockwood, New York, N.Y., and Henry Kressel, Elizabeth, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,324
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **9 Claims**

1. A semiconductor injection laser comprising:

a rectangular parallelepiped body of a single crystalline semiconductor material having opposed facet surfaces, opposed side surfaces extending to said facet surfaces, opposed contact surfaces extending to said facet surfaces and said side surfaces, with a recombination region capable of generating electroluminescence in said body and capable of operating at power levels up to a few milliwatts per micrometer of emitting radiation width, said recombination region extending from one facet surface to the opposite facet surface; and



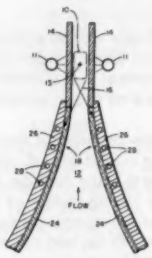
a protection layer on at least one facet surface capable of reducing facet erosion of said facet surface, said protection layer being of an optical thickness, equal to approximately "n" times one-half the vacuum wavelength of the emitted radiation, where "n" is an integer equal to or greater than 1.

4,178,565

FLUID LASER FLOW CHANNEL LINER

Richard G. Morton, North Reading, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Nov. 17, 1977, Ser. No. 852,224
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 D **17 Claims**



1. A fluid laser comprising:

a channel having a flow therethrough of a laseable fluid;

means for exciting the laseable fluid in said channel to cause laser radiation including fluorescent radiation to be produced in a region of said channel;

a conduit for the flow of said fluid upstream of said channel and having;

at least one cooled wall member;

means for thermally insulating said wall member from said flow in said conduit;

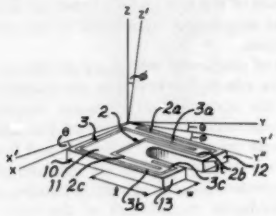
said insulating means being transmissive to said fluorescent radiation so that said fluorescent radiation passes through said insulating means to said cooled wall members thereby avoiding heating of said flow in said conduit.

4,178,566

QUARTZ CRYSTAL TUNING FORK VIBRATOR FOR A CRYSTAL OSCILLATOR

Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 751,336, Dec. 16, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,435
Claims priority, application Japan, Dec. 19, 1975, 50-151670
Int. Cl.[2] H03B 5/36; H03H 9/18, 9/20
U.S. Cl. 331—156 9 Claims



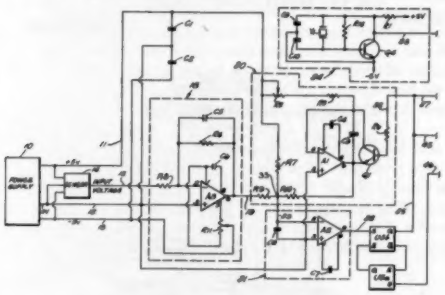
1. In an oscillator circuit, a flexural quartz crystal vibrator of the tuning fork type having an electromechanical coupling factor within the range of 2.5% to 3.5%.

4,178,567

PERIOD-MODULATED VOLTAGE CONTROLLED OSCILLATOR

Richard A. Johnson, Long Beach, Calif., assignor to Scientific Drilling Controls, Irvine, Calif.

Filed May 4, 1978, Ser. No. 903,011
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—177 R 15 Claims



1. A period-modulated voltage controlled oscillator comprising:

a base oscillator operating at a predetermined uniform frequency;

a counter operable to count a predetermined number of oscillations of said base oscillator, and acting to thereby measure a base time period corresponding in duration to said number of oscillations;

a ramp generator controlled by an input signal of varying voltage and acting to produce a voltage ramp continuing for a second period whose duration varies in accordance with variations in the voltage of said input signal;

means responsive to said counter and said ramp generator for combining said base time period and said second period into a combined period; and

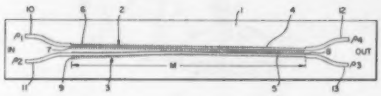
means controlled by said last mentioned means for producing an oscillating output signal having a period determined by said combined period.

4,178,568

STRIPLINE COUPLER HAVING COMB ELECTRODE IN COUPLING REGION

David J. Gunton, West Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 27, 1978, Ser. No. 890,767
Claims priority, application United Kingdom, Apr. 1, 1977, 13926/77
Int. Cl.[2] H01P 5/18
U.S. Cl. 333—116 14 Claims



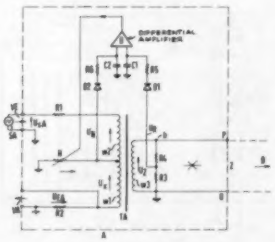
1. A coupling device comprising a dielectric substrate having two opposing faces, a ground sheet electrode on one face of the substrate and two elongate spaced electrodes on the other face of the substrate coupled to one another along at least a part of their respective lengths so that a portion of the power of a signal applied along one of the electrodes is transferred to the other, wherein at least one of the electrodes is a comb electrode comprising a main conductor or bus bar formed along its coupled length with a series of spaced electrode fingers projecting transversely from both sides thereof.

4,178,569

HYBRID FOR TWO-WIRE FULL-DUPLEX TRANSMISSION OF DIGITAL SIGNALS

Jörg Reutter, Pleidelsheim, and Wolfgang Dietze, Korntal, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,086
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714803
Int. Cl.[2] H01P 5/16
U.S. Cl. 333—119 11 Claims



1. A hybrid with a balancing network for connecting a transmitter and a receiver to a two-wire line having a given impedance for full-duplex transmission of digital signals comprising:

a control circuit including

first means coupled to said two-wire line to provide a first mean time value of voltage present on said two-wire line;

second means coupled to said balancing network to provide a second mean time value of voltage appearing across said balancing network; and

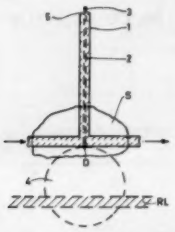
third means coupled to said first and second means to compare said first and second mean time value of voltages to generate a control signal to control the impedance of said balancing network.

4,178,570

MICRO-SLOT-STRIPLINE PHASE SHIFTER

Burkhard Schiek, and Jürgen Köhler, both of Halstenbek, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,399
Int. Cl.[2] H01P *3/08, 1/18*
U.S. Cl. 333—161 **12 Claims**



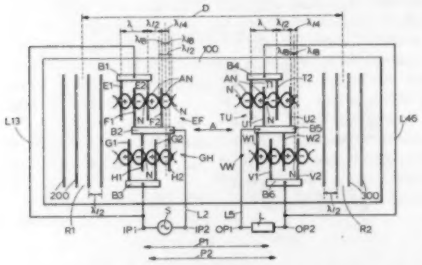
1. A phase shifter comprising a substrate having a top and a bottom surface, a microstrip line provided on the top surface, a conductive base plate arranged on the bottom surface, a microstrip stub arranged on the top surface and having one end connected electrically in parallel to the microstrip line, said stub being open at the end not connected to the microstrip line and a slotted line arranged in the base plate below the stub, one end of said slotted line being short circuited in the region of the open end of the stub and the other end of said slotted line being open.

4,178,571

ACOUSTIC SURGAVE WAVE RESONATOR DEVICES

Richard F. Mitchell, Merstham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,615
Claims priority, application United Kingdom, Feb. 4, 1977, 4643/77
Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—194 **12 Claims**



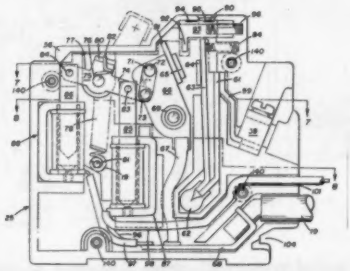
1. An acoustic surface wave resonator comprising
a substrate having a piezoelectric surface,
a pair of input terminals,
input transducing means disposed on the surface and connected to said input terminals for converting an electrical input signal into travelling acoustic surface waves with a predetermined direction of propagation,
a pair of reflectors on said surface which are disposed on both sides of the input transducing means in the direction of propagation so as to define a resonant cavity which is capable of supporting an acoustic surface standing wave resonance pattern,
a pair of output terminals, and
output transducing means connected to said output terminals and disposed on said surface inside the resonant cavity for converting acoustic surface wave energy into an electrical output signal, and wherein:
each of said transducing means comprise a first and a second interdigital transducer which are displaced relative to each other both normal to and parallel to said direction of propagation and with each transducer comprising two sets of electrodes, the electrodes of each set being electrically connected in common,
each of said input terminals and each of said output terminals is connected to a different pair of electrode sets, one set forming part of the first and the other set forming part of the second interdigital transducer of the relevant transducing means,
the two sets of electrodes which are jointly connected to a terminal are selected so that they are coupled to the same phase of the acoustic surface wave resonance pattern which co-operates with the relevant transducing means, whereas both the two input terminals and the two output terminals are coupled to mutually opposite phases of said resonance pattern via the sets of electrodes, and
the first interdigital transducers of the two transducing means are spaced apart by a first distance in the direction of propagation and the second interdigital transducers of said two transducing means are spaced apart by a second distance and the two sets of electrodes, which are connected to each of said terminals, are selected in cooperation with said first and second distances in such a way that for each output terminal the two sets of electrodes connected thereto respond to travelling acoustic surface waves launched by the input transducing means with opposite potentials.

4,178,572

LOAD MANAGEMENT APPARATUS

George Gaskill, Hatboro, and John Horn, Philadelphia, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 3, 1978, Ser. No. 893,209
Int. Cl.[2] H01H *75/00, 77/00*
U.S. Cl. 335—14 **14 Claims**

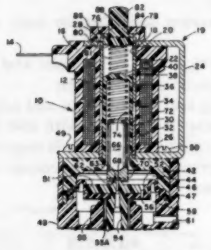


1. Load management apparatus including a manually operable switching section and a remotely operable management section; said switching section including interrupter contact means, a manually operable spring powered first mechanism connected to said interrupter contact means for opening and closing thereof, fault responsive trip means operatively connected to said first mechanism to operate the latter for opening of said interrupter contact means upon the occurence of predetermined fault currents at said switching section; said management section including main contact means connected in series circuit with said interrupter contact means and an electrical load energized through said apparatus, a spring powered second mechanism connected to said main contact means for opening and closing thereof, remotely controlled electrically powered operator means operatively connected to said second mechanism for selectively operating the latter to open and close said main contact means.

4,178,573
ELECTRICALLY OPERATED DEVICE AND VALVING MECHANISM EMPLOYING SAME

Wesley S. Swanson, Elk Grove Village, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 23, 1977, Ser. No. 854,182
Int. Cl.[2] H01F 7/16
U.S. Cl. 335—255 **18 Claims**



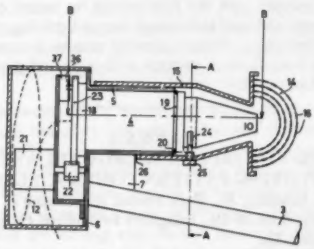
1. An electrically operated device for performing a function in response to energization by an electrical source comprising:
(a) electrical coil means providing, upon energization by said electrical source, magnetic flux;
(b) ferromagnetic means defining a first magnetic pole, said first pole being movable between a first and second position; said ferromagnetic means including means defining a second magnetic pole disposed interiorly of said coil means, said second pole being stationary with respect to said coil means, said first and second magnetic poles forming a series magnetic flux circuit, said movable pole having a first position in which said magnetic flux traverses an air gap defined between said second pole means and said first pole, said movable pole having a second position in which said air gap is substantially closed;
(c) movable armature means disposed within said coil means and spaced closely adjacent said air gap, said armature means being movable between a first and second position in response to magnetomotive force generated by current flow in said coil means, said armature means in said second position being situated so as to minimize the reluctance encountered by said magnetic flux through said air gap;
(d) means biasing said armature means toward said first position;
(e) actuating means operably associated with said first ferromagnetic means and operable upon selective movement thereof for moving said first pole means to said second position thereby closing said air gap and dissipating the magnetomotive force on said armature means whereupon said biasing means returns said armature means to said first position.

4,178,574
HORN ANTENNA WITH ROTATING WAVEGUIDE AND POLARIZATION LENS MEANS

Jan W. Edens; Theodorus H. A. M. Vlek, and Wilhelmus H. C. Withoos, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,129
Claims priority, application Netherlands, Jan. 12, 1977, 7700230
Int. Cl.[2] H01Q 13/02
U.S. Cl. 343—756 **6 Claims**

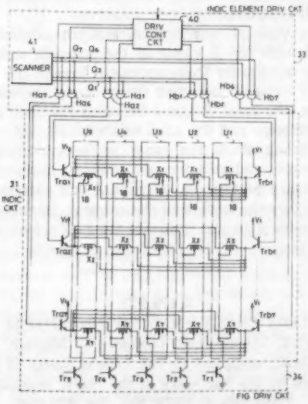
1. An antenna feed system comprising a rectangular horn having a rectangular aperture, a rectangular waveguide connected to said horn, said horn and waveguide being formed from two parts joined together so that the junction therebetween is in the longitudinal symmetry plane parallel to the electric field of the TE_{01} waveguide mode, a polarisation converter including a screen comprising a plurality of dielectric layers each having a conductor pattern provided thereon such that said patterns form a predominantly capacitive load for one component of the electric field of an electromagnetic wave incident on said screen, and a predominantly inductive load for a second component of said field which is perpendicular to said one component, first means for supporting said screen in front of said aperture for rotation about the longitudinal axis of said waveguide and second means for supporting said horn and waveguide connected thereto for rotation about said longitudinal axis relative to said screen.



4,178,575
INDICATING APPARATUS FOR INDICATING NUMERALS OR LETTERS BY A PLURALITY NUMBER OF INDICATING ELEMENTS

Masami Ono, Yamanashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jul. 12, 1977, Ser. No. 815,353
Claims priority, application Japan, Jul. 15, 1976, 51-83492
Int. Cl.[2] G09F 9/32
U.S. Cl. 340—764 **3 Claims**



1. An indicating apparatus comprising: a plurality of indicating parts respectively having a plurality of indicating elements operated to indicate and maintain their indicating states; indicating element driving means provided in respective indicating elemtns and adapted to drive said indicating elements; a first group of transistors provided in correspondence with respective indicating parts and adapted to close and open current supplying lines to respective indicating element driving means for each of said indicating parts; a group of AND gates adapted to carry out ON and OFF control of respective transistors of said first group of transistors; means for sending a signal to said AND gates group interrelatedly with indicating initiation operation; means for generating indicating signals; indicating element driving circuits provided in correspondence with each of said indicating parts; and means for supplying said indicating

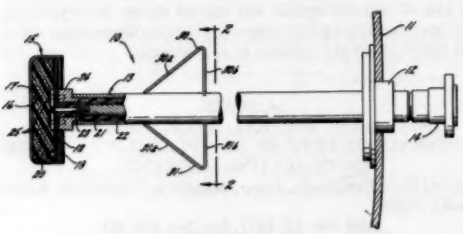
signal to said indicating element driving circuits sequentially in a time-division manner with a first period, and further for sending a time-division signal to said AND gates group sequentially with the first period, said transistors of said first group of transistors being rendered ON and OFF sequentially in a time-division manner with the first period by means of said AND gates group, and said indicating element driving circuits causing said indicating element driving means to operate sequentially in a time-division manner with a second period which is shorter than the first period.

4,178,576

FEED SYSTEM FOR MICROWAVE ANTENNA EMPLOYING PATTERN CONTROL ELEMENTS

Daniel R. Schmidt, Jr., Park Forest, and Joseph F. Busse, Calumet City, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Sep. 1, 1977, Ser. No. 829,604
Int. Cl.[2] H01Q *19/14*
U.S. Cl. 343—781 R **9 Claims**



1. A dish-type microwave antenna having a feed system comprising

(a) a prime-focus type radiator located at the focal point of the antenna for directing a primary radiation pattern onto the dish-type antenna,

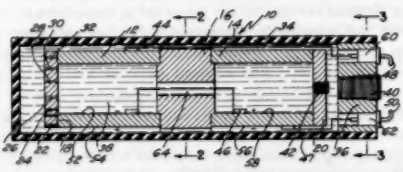
(b) and a pair of symmetrical pattern control elements aligned with the E plane of the antenna and extending radially outwardly from opposite sides of the axis of the primary radiator between the primary radiator and the antenna, the axial distance between the face of said primary radiator and the axial midpoint of said control elements being about the same as the wavelength of the microwaves radiated by said primary radiator to widen the primary pattern and distribute said pattern more uniformly over the surface of the antenna, thereby increasing the antenna gain and reducing the half power beamwidth of the antenna in both the E and H planes.

4,178,577

LOW FREQUENCY HYDROPHONE

Hector J. Cini, Mystic, and Theodore J. Meyers, Waterford, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,056
Int. Cl.[2] H04B *13/00*
U.S. Cl. 367—159 **9 Claims**



1. A pressure-balanced acoustic transducer having a low cut-off frequency in a liquid medium comprising:

a plurality of piezo-ceramic tubes being connected together forming a unit with one end of one of said plurality of piezo-ceramic tubes forming a first open end of said unit and one end of another one of said plurality of piezo-ceramic tubes forming a second open end of said unit;

a solid cap means being secured to the first open end of said unit;

a sintered metal cap means having a plurality of pores therein, being secured to the second open end of said unit;

a flexible boot for housing said unit, said flexible boot having an open end;

means for covering said flexible boot at the open end thereof;

a fluid for filling said flexible boot and said unit of said plurality of piezo-ceramic tubes;

means for filling said flexible boot and said unit of said plurality of piezo-ceramic tubes with said fluid; and

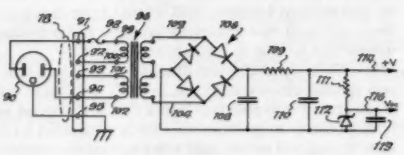
means for extracting voltage signals responsive to an acoustic wave impinging upon said acoustic transducer in the liquid medium.

4,178,578

PEST CONTROL APPARATUS

Lester B. Hall, 249 Kinsey Ave., Kenmore, N.Y. 14217, assignor to Gary Lester Hall, Kenmore, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,536
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—139 **19 Claims**



1. Apparatus for generating and radiating ultrasonic sound waves for the control of pests comprising:

(a) supporting means;

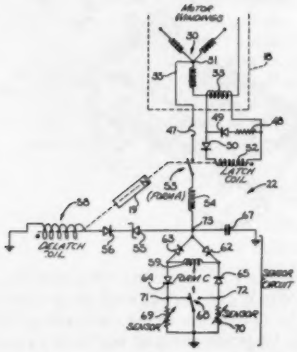
(b) sound generating means carried by said supporting means and comprising first and second transducer means for providing sound waves when driven by corresponding electrical signals, each of said first and second transducer means having a natural frequency of oscillation, said sound waves being at frequencies normally inaudible to humans and intolerable by pests as rodents and the like, and driver means connected to said first and second transducer means for applying electrical signals to said first and second transducer means in a manner causing said first and second transducer means each to seek the natural frequency of oscillation thereof but never to stabilize at such natural frequencies so as to provide a composite output in the form of an unstable pattern of frequencies and amplitude peaking in the ultrasonic frequency range; and

(c) a reflector extending from said supporting means and positioned relative to said first and second transducer means in a manner providing directional concentration of said output waves.

4,178,579
REMOTE INSTRUMENTATION APPARATUS

James R. McGibbeny; John D. Lydick, both of Manhattan Beach, Calif.; Anthony G. Linowiecki, Houston, Tex., and Robert R. Harms, Rancho Palos Verdes, Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 5, 1976, Ser. No. 729,645
Int. Cl.[2] G01V 1/40
U.S. Cl. 340—856 30 Claims

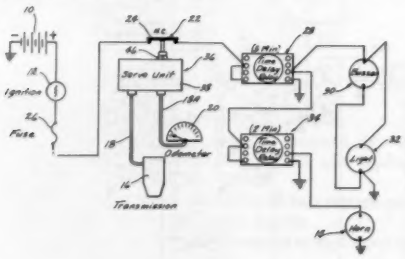


19. In an installation in which conductors of a cable carry AC power from a power source to an AC operating device disposed remotely from said source and at least some of the same cable conductors carry DC signals from a control site to instrumentation apparatus disposed remotely from said control site, the improvement comprising switching means disposed remotely from said control site for connecting said apparatus to and disconnecting said apparatus from said cable, coupling means reponsive to AC applied to said cable, and isolated from DC applied to said cable, for operating said switching means to connect said apparatus to said cable, and means responsive to DC of at least a predetermined magnitude applied to said cable for operating said switching means to disconnect said apparatus from said cable.

4,178,580
FUEL SAVING SIGNALING APPARATUS FOR A MOTOR VEHICLE

Anthony E. Dombrowski, 9903 Broadmoor Dr., Omaha, Nebr. 68114

Filed Mar. 12, 1979, Ser. No. 19,504
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—52 D 7 Claims



1. A fuel saving signaling apparatus for a motor vehicle including an ignition system, a source of electrical energy, a motor and a rotatable means which is rotated when the vehicle is driven, comprising,

a normally closed switch means operatively electrically connected to the ignition system and source of electrical energy,

a signaling means,

a first electrical time delay means series connected to said switch means and said signaling means and imposed therebetween,

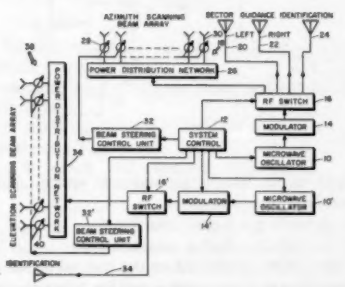
said first time delay means energizing said signaling means after a predetermined period of time has elapsed after said first time delay means has been energized by said switch means,

said switch means being positioned adjacent said rotatable means and being operatively connected thereto so that said rotatable means will cause said switch means to move from its closed position to its open position when said vehicle is being driven thereby preventing the energization of said signaling means while said vehicle is being driven but permitting said switch means to move to its closed position when the movement of the vehicle has been halted thereby energizing said first time delay means so that the signaling means will be energized when the motor vehicle has been idling for a predetermined length of time.

4,178,581
INTEGRATED ANTENNA APERTURE

Robert E. Willey, Sr., Joppa, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 3, 1978, Ser. No. 957,492
Int. Cl.[2] G01S 1/16, 1/18
U.S. Cl. 343—108 M 4 Claims



1. In a microwave landing system providing narrow scanning beam of microwave energy for guiding an aircraft during approach and landing and providing data signals transmitted in a broad pattern so as to be receivable in a greater area than the area covered by said narrow scanning beam, said system including a phased array antenna having a plurality of radiating elements with adjustable phase shifter means for adjusting the relative phases of currents radiated by said elements and signal sequence control means for controlling the sequence of transmission of said narrow beam signals and said broad beam signals, the improvement comprising

means for applying non-uniform values of phase shift to said phase shifters of said array to broaden the antenna pattern of said array, said non-uniform values of phase satisfying the relationship

$$d^2\phi(x)/dx^2 = c\, f^2(x)/P(\theta)$$

wherein

c is a constant;

f(x) is the aperture illumination function;

θ is the space angle;

x is the distance along the array; and

$\phi(x)$ is the non-uniform phase function; and

means applying uniform values of phase shift to said phase shifters of said array to cause said array to transmit with a

narrow pattern in a direction determined by the value of said uniform phase shifts;

said sequencer selecting said means for applying non-uniform values of phase shift or said means for applying uniform values of phase shift according to whether or not transmission in a broad beam antenna pattern is desired.

4,178,582

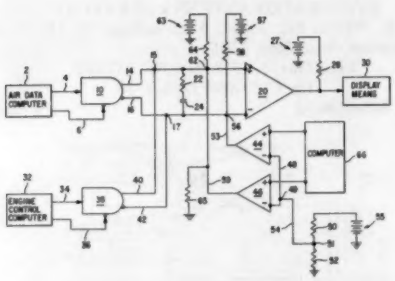
DIGITAL SIGNAL TRANSMITTER/RECEIVER SYSTEM INCLUDING PROGRAMMABLE SELF-TEST CAPABILITY

Jay L. Richman, Montville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 26, 1978, Ser. No. 919,105

Int. Cl.[2] G08C *25/00*

U.S. Cl. 340—146.1 E **14 Claims**



1. A digital signal transmitter/receiver system including self-test capability, comprising:

means for providing a digital data signal;

means for providing a digital control signal;

a digital line driver connected to the control signal means and responsive to the control signal for being rendered in ON and OFF states;

the digital line driver connected to the data signal means and responsive to the signal therefrom for providing a pair of differential signals, one of the signals switching between logic LOW and logic HIGH states and the other signal switching between logic HIGH and logic LOW states when the driver is rendered ON;

a pair of signal transmission lines connected to the driver, each of which transmits one of the differential signals when the driver is rendered ON and being in a high impedance state when the driver is rendered OFF to inhibit transmission of the signals;

a resistor and a capacitor serially connected across the signal transmission lines for providing a line impedance matching network;

differential receiver means connected to the signal transmission lines for receiving the signals transmitted thereby and for providing an output signal;

differential comparator means connected to the signal transmission lines; and

means for programming input signals to the comparator means whereby the comparator means provides output signals for controlling the logic state of the signals transmitted over the transmission lines to the receiver to control the logic state of the receiver output signal in accordance with a test program.

4,178,583

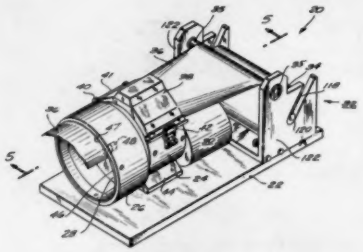
ROTARY PRINTING METHOD

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,975

Int. Cl.[2] G01D *15/08*; G03G *15/04*

U.S. Cl. 346—163 **2 Claims**



1. A method of rotary printing comprising providing a rotor with a plurality of styli, curving sideways an elongated strip of recording material to conform to the curvature of said rotor, passing said strip longitudinally past said rotor in a direction transverse to the plane of rotation of said rotor, energizing said styli in a pre-determined sequence to form characters on said strip in longitudinal lines and transverse columns, said characters being horizontally aligned in said longitudinal lines, said energizing step including storing in memory character codes representing the characters in a message of a pre-determined length, reading said codes out of memory in the order in which said characters are to appear in successive columns, and utilizing said codes to control the energization of said styli to form the corresponding characters on said strip.

4,178,584

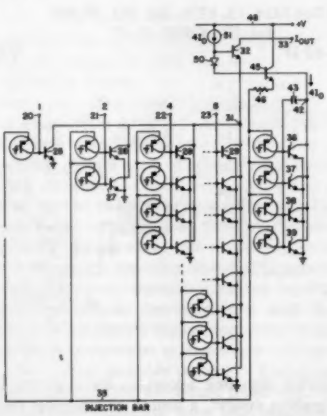
INTEGRATED INJECTION LOGIC DIGITAL-TO-ANALOG CONVERTER EMPLOYING FEEDBACK REGULATION AND METHOD

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1978, Ser. No. 871,672

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 DA **13 Claims**



12. An integrated circuit disposed in a substrate providing digital-to-analog conversion and employing feedback to regu-

late collector currents of a plurality of integrated injection logic (I^2L) switching transistors comprising:

(a) digital input means for receiving a digital signal,

(b) a plurality of switching transistors characterized by operating parameters, said plurality of switching transistors being disposed in the substrate, coupled to said digital input means, and responsive to said digital signal for switching said plurality of switching transistors between conductive and nonconductive states,

(c) at least one reference transistor disposed in the substrate and having at least a collector terminal,

(d) injection bar means disposed in the substrate in proximity to said plurality of switching transistors and in proximity to said at least one reference transistor, said injection bar means forming a plurality of lateral injection transistors in conjunction with said plurality of switching transistors and with said at least one reference transistor for supplying bias current to said plurality of switching transistors and for supplying bias current to said at least one reference transistor,

(e) biasing means disposed in the substrate and coupled to said injection bar means and to the collector terminal of said at least one reference transistor for supplying a constant current to the collector terminal of said at least one reference transistor and for providing a bias voltage to said injection bar means such that the collector current in each of said plurality of switching transistors is maintained substantially constant over variations in said operating parameters when each of said plurality of switching transistors is switched to said conductive state, and

(f) summing means disposed in the substrate and coupled to said plurality of switching transistors for summing the currents conducted by said plurality of switching transistors and for providing an analog output signal.

4,178,585

ANALOG-TO-DIGITAL CONVERTER

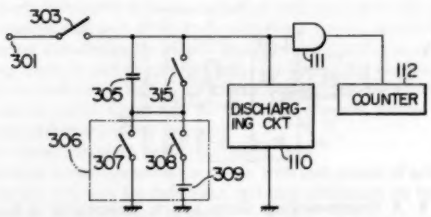
Katsuaki Takagi; Toshiro Tsukada, both of Kokubunji; Hisashi Tsuruoka, Hachioji, and Michio Hara, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 22, 1978, Ser. No. 935,963

Claims priority, application Japan, Aug. 29, 1977, 52/102710

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 NT **12 Claims**



1. An analog-to-digital converter comprising:

(a) a storage means with an input terminal, to which an analog signal is applied, for storing said analog input signal,

(b) a discharging circuit coupled with said storage means for discharging the charge stored therein,

(c) a level detection circuit connected to said input terminal of said storage means,

(d) a counting means connected to said level detection circuit for counting the number of clock-pulses in the period of discharging,

(e) a bias voltage supply means connected in series with said storage means, and

(f) a short-circuiting means connected in parallel with said storage means.

4,178,586

BISTABLE DEVICE FOR REPRESENTATION OF A POINT OF A TACTILE INFORMATION

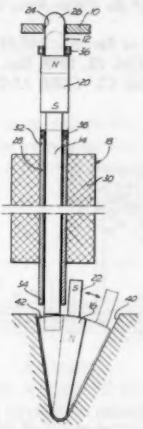
Klaus P. Schönherr, Schloss Solitude 3, Stuttgart 1, Fed. Rep. of Germany (7000)

Filed Jul. 31, 1978, Ser. No. 929,695

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734886; Nov. 5, 1977, 2749585

Int. Cl.² G09B *21/00*

U.S. Cl. 340—407 **11 Claims**



1. A bistable device for representation of a point of tactile information, comprising

a housing defining an upper touch surface formed with a vertical bore,

a touch pin having an upper touchable end and being axially displaceably disposed in said bore between a lifted position, in which said touchable end projects said touch surface and a lowered position in which said touchable end is underneath said touch surface,

a locking body operatively cooperating with said touch pin and mounted in said housing displaceable from an inoperative position into an operative position and reversely, in said operative position said locking body blocks a displacement of said touch pin into said lowered position, in said inoperative position said locking body permits the displacement of said touch pin into said lowered position,

an electromagnetic means for operatively moving said touch pin, said electromagnet means has an immoveable hollow core and a magnetic core surrounding said hollow core, said electromagnetic means forms an upper front pole and a lower rear pole,

a non-magnetic rod is moveably guided in said hollow core, said rod lengthens said touch pin, and said rod has a rear portion facing away from said touchable end of said touch pin, said rear portion cooperates with said locking body,

a first permanent magnet mounted on said touch pin and/or on said rod between said touchable end of said touch pin and said front pole of said electromagnet means, said front pole being adjacent to said first permanent magnet, said first permanent magnet defines a straight pole axis parallel to the axis of said rod,

said locking body is moveably disposed in said housing under said rear portion of said rod,

a second permanent magnet arranged operatively adjacent said rear pole of said electromagnet means, said rear pole facing away from said first permanent magnet, said second permanent magnet is connected with said locking body and forms a moveable unit with said locking body, said second permanent magnet has an operative pole spaced remote from said rear pole of said electromagnet means in said inoperative position of said locking body and lying

closely adjacent to said rear pole of said electromagnetic means in said operative position of said locking body,

said operative pole of said second permanent magnet facing said rear pole of said electromagnet means and is polewise the same as one pole of said first permanent magnet, said one pole of said first permanent magnet facing said front pole of said electromagnet means.

4,178,587

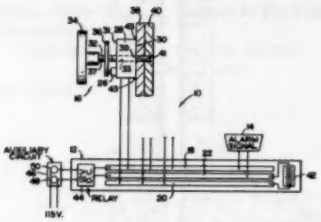
SECURITY LOCK SYSTEM

Fred W. Jamison, 215 E. Palm Ave., Apt. 411, Tampa, Fla. 33602

Continuation-in-part of Ser. No. 849,677, Nov. 8, 1977. This application Oct. 25, 1978, Ser. No. 954,657

Int. Cl.[2] G08B *13/06*

U.S. Cl. 340—542 **9 Claims**



1. A security lock system of the type primarily intended for signalling unauthorized opening of protected fixtures, said security lock system comprising in combination: at least one lock switch means attached to the fixture to be protected; and alarm means electrically connected to said lock switch means whereby unauthorized opening of said lock switch means will actuate said alarm means; said lock switch means comprising bolt means removably engageable with the fixture to be protected and switch means mechanically attached to said bolt means and the fixture to be protected; said bolt means comprising a threaded bolt and a collar formed thereon and said switch means including a threaded aperture formed therethrough and comprising on/off state control means disposed substantially adjacent said aperture in operative relation to said collar, said bolt being movably disposed in said aperture such that at least a portion of said bolt will extend beyond said switch means for engaging the fixture to be protected, and wherein said alarm means comprises direct current circuit means comprising signal means electrically connected to siad switch means, whereby said collar operatively engages said switch means and unauthorized removal of said collar from said switch means will energize said signal means.

4,178,588

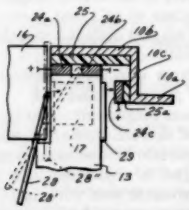
BURGLAR ALARM SYSTEM

James Queren, 218-07 43rd Ave., Bayside, N.Y. 11361

Filed Jul. 5, 1978, Ser. No. 921,903

Int. Cl.[2] G08B *13/06;* **H01H** *27/00*

U.S. Cl. 340—545 **7 Claims**



1. A burglar alarm system mounted in a doorway framing which comprises a wooden door jamb having two substantially parallel major faces and two minor faces substantially perpendicular to the major faces, one of the major faces having a recessed end portion delimited by one of the minor faces and a shoulder constituting a stop for a door, and the door jamb defining a door latch bolt hole in the recessed end portion, a wall including wooden wall stud means adjacent the other major face of the door jamb, the door jamb being mounted on the wall and the minor faces of the door jamb extending substantially parallel to the wall, and a reinforcement metal plate extending over a substantial portion of the wall stud means and a substantial portion of the one minor face of the door jamb, the reinforcement plate being securely affixed to the wall stud means and the one minor face of the door jamb and covering a substantial region of the minor door jamb face adjacent and beyond the door latch bolt hole, the securely affixed plate holding the door jamb firmly in position, the burglar alarm system comprising

(a) a pair of elongated electrically conductive sheets arranged between the minor door jamb face and the reinforcement plate, the electrically conductive sheets extending in side-by-side relationship along a major portion of the reinforcement plate and being electrically insulated from each other,

(b) an electrically insulating sheet arranged between the reinforcement plate and the pair of electrically conductive sheets,

(c) a burglar alarm, and

(d) an electric control circuit connected to the burglar alarm and energizable to set off the alarm, the circuit being connected to the electrically conductive sheets and being energized upon electrical contact being made between the sheets.

4,178,589

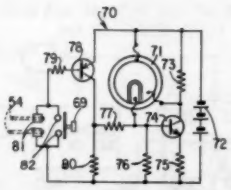
THUMB-SUCKING ALARM SYSTEM

Robert G. Nunn, 6416 E. Lake Dr., San Diego, Calif. 92119; Louis M. Frank, Sunnyvale, Calif., and Ronald G. Bittle, 108 Peach Dr., Anna, Ill. 62906, assignors to Robert Gregory Nunn, Evanston and Ronald G. Bittle, Anna, both of Ill., a part interest to each

Filed Mar. 23, 1978, Ser. No. 889,278

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—573 **6 Claims**



1. A thumb-sucking alarm system comprising a housing adapted to be secured to the wrist of a user, signal-generating means disposed in said housing, sensing means coupled to said signal-generating means and adapted to be secured to a thumb of the user for disposition in the user's mouth when the user sucks the thumb, said signal-generating means being responsive to the presence of moisture on said sensing means for producing an output signal, alarm means mounted in said housing and coupled to said signal-generating means and responsive to said output signal for producing an audible alarm indicating that the user is sucking his thumb, said sensing means being disposable and including an elongated flexible tape provided at one end thereof with a moisture-accepting portion adapted to be secured in use on the thumb of a user, a pair of electrodes spaced apart on said moisture-accepting portion, a pair of electrical conductor leads respectively connected to said electrodes and insulated from each other and extending the length of said tape

to the other end thereof, and means releasably coupling said other end of said tape to said housing with the adjacent ends of said lead conductors electrically connected to said signal-generating means, said signal-generating means being operable to produce said output signal in response to the establishment of a low-resistance path by moisture on said moisture-accepting portion between said electrodes when the user sucks the thumb.

4,178,590

ELECTRONIC WEFT THREAD MONITOR FOR SHUTTLELESS WEAVING MACHINES

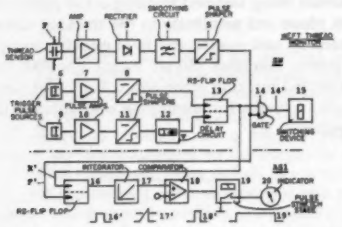
Erich Weidmann, Wetzikon, Switzerland, assignor to Gebrüder Loepfe AG, Zurich, Switzerland

Filed Jan. 17, 1978, Ser. No. 870,181

Claims priority, application Switzerland, Feb. 12, 1977, 001966/77

Int. Cl.[2] **B65H** *63/00;* **D04B** *35/14;* **G08B** *21/00*

U.S. Cl. 340—677 **6 Claims**



1. In an electronic weft thread monitoring device for shuttleless weaving machines, comprising a signal processing channel producing at its output an output signal in the form of a thread travel signal indicative of weft insertion; trigger circuitry controlled by the weaving machine and producing at its output an output signal in the form of a signal controlling the duration of monitoring the thread travel signal, the trigger circuitry comprising a delaying circuit for delaying the end of the controlling signal, the improvement which comprises:

the delaying circuit being provided with delay setting means;

timing circuitry having first and second input means respectively connected with the outputs of said signal processing channel and said trigger circuitry, said timing circuitry being actuated by the output signals of said signal processing channel and trigger circuitry, for generating a timing pulse indicating the time difference between the end of the thread travel signal and the controlling signal, minus a predetermined safety interval;

said timing circuitry having an output; and

indicator means connected in circuit with said output of said timing circuitry for indicating said time difference on the output of said timing circuitry.

4,178,591

CRANE OPERATING AID WITH OPERATOR INTERACTION

Steven Geppert, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1978, Ser. No. 917,450

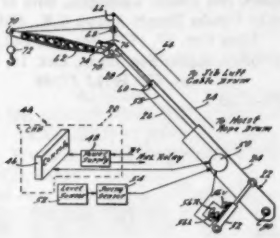
Int. Cl.[2] **G08B** *21/00*

U.S. Cl. 340—685 **58 Claims**

1. A crane operating aid comprising:

sensor means operative to monitor a plurality of predetermined crane status parameters and to generate a separate output signal as a function of each said status parameter;

operator interface means operative in response to operator initiative to sequentially present a series of prompting crane status requests to an operator and to sequentially receive operator responses thereto; and



logic means operative to selectively receive said output signals and operator responses, and to generate a crane condition signal as a function thereof.

4,178,592

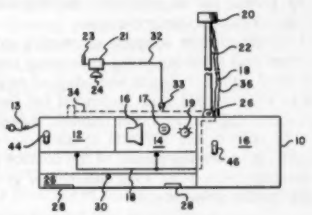
FIRE ALARM HAVING A SENSOR ON AN EXTENSIBLE ARM

Maureen K. McKee, 8200 Redlands Ave., Playa Del Rey, Calif. 90291

Filed Jan. 23, 1978, Ser. No. 871,384

Int. Cl.[2] **G08B** *17/06*

U.S. Cl. 340—693 **23 Claims**



1. A portable fire detector comprising:

(a) a sensor for producing an electrical signal when detecting signs of a fire,

(b) alarm circuitry coupled to said sensor for producing an alarm signal when said electrical signal is received from said sensor,

(c) alarm means coupled to said alarm circuitry for producing a detectable warning signal when activated by said alarm signal,

(d) a power supply coupled to said sensor, alarm circuitry and alarm means for providing operating power thereto,

(e) housing means for containing said alarm circuitry, alarm means and power supply, and

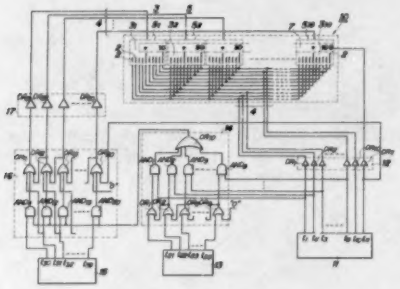
(f) extensible means pivotally and rotatably attached to said housing means for receiving said sensor at the outermost end thereof whereby said sensor may be positioned anywhere within a hemisphere of revolution generated by sweeping said extensible means through 360° of rotation about its pivot point while moving from a vertical position to a horizontal position, the maximum radius of said hemisphere of revolution being equal to the fully extended length of said extensible means and the minimum radius of said hemisphere being equal to the shortest collapsed length of said extensible means.

4,178,593

DRIVING CIRCUIT FOR A LUMINESCENT DISPLAY TUBE FOR ANALOG DISPLAY

Takao Kishino, and Toshio Kamagata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Oct. 17, 1977, Ser. No. 842,804
Claims priority, application Japan, Oct. 15, 1976, 51-122951
Int. Cl.[2] H01J *17/48*
U.S. Cl. 340—753 **5 Claims**



1. A driving circuit for a luminescent display tube for analog display, said luminescent display tube at least a plurality of segment anodes arranged in a predetermined direction and each provided with a luminescent material layer adapted to luminesce when bombarded with thermions, said segment anodes being divided into a plurality of groups each having the same number of said segment anodes, the corresponding segment anodes of the respective groups being connected in common, and a plurality of control grids provided separately for the respective groups, the driving circuit comprising:

a scanning pulse generating circuit section for generating scanning pulses for successively driving said segment anodes connected in common; and

a control circuit section adapted to receive said scanning pulses from said scanning pulse generating circuit section and inputted numeric signals and adapted to give driving signals to said control grids provided for the respective groups according to said input numeric signals,

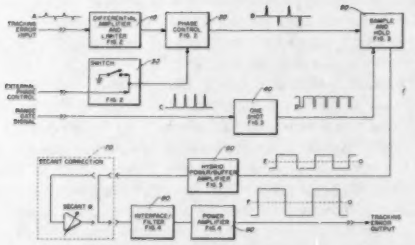
whereby the ratio of the duration of luminescence of each segment to the scanning period of the control grids can be kept constant even if the total number of groups of said segment anodes is increased.

4,178,594

ANGLE SERVO PREAMPLIFIER

Stephen J. Senger, Jamestown, N. Dak., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,624
Int. Cl.[2] G01S *3/14*
U.S. Cl. 343—7.4 **18 Claims**



1. In a precision tracking radar system which functions to lock a narrow-beam tracking antenna onto a target in order to track the position of that target, the tracking radar system incorporating an antenna servo drive system to continuously reposition the tracking antenna on target, the antenna servo drive system being responsive to tracking error pulses, for both the antenna azimuth and the antenna elevation dimension, correlated in amplitude to the magnitude of tracking antenna pointing errors relative to the target; an angle servo preamplifier for amplifying the tracking error pulses associated with the antenna azimuth and antenna elevation dimensions comprising:

a. a differential amplifier circuit having first and second inputs coupled to receive the tracking error pulses, said differential amplifier circuit amplifying the tracking error pulses and, in addition, providing noise suppression by reason of the common mode rejection properties of differential amplifiers;

b. sample and hole circuit means coupled to receive the tracking error pulse output from said input circuit means, for sampling the tracking error pulses while suppressing any significant switching transients attendant to the sampling process; the output of said sample and hold circuit means being sampled tracking error pulses corresponding in phase and amplitude to the tracking error pulses sampled by said sample and hold circuit means; and

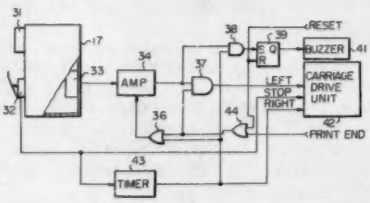
c. power amplifier circuit means coupled to receive the sampled tracking error pulses from said sample and hold circuit means for amplifying said sampled tracking error pulses.

4,178,595

INK JET PRINTING APPARATUS WITH INK REPLENISHING

Koichiro Jinnai; Masanori Horike; Kyuhachiro Iwasaki, and Yutaka Kodama, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,245
Claims priority, application Japan, Nov. 4, 1977, 52-132378
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



1. An ink jet printing apparatus including a movable ink jet printing head, a first ink tank attached to the printing head for supplying ink thereto and a second ink tank separate from the printing head, characterized by comprising:

sensor means for sensing when an amount of ink in the first ink tank is below a predetermined level and producing a first signal in response thereto;

control means;

supply means actuated by the control means in response to the first signal for communicating the second ink tank with the first ink tank and urging ink to flow from the second ink tank into the first ink tank; and

annunicator means for producing an indication in response to a second signal;

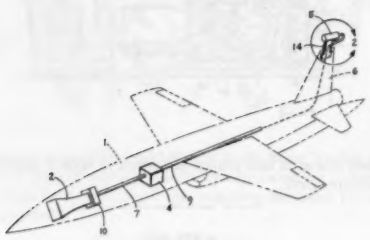
the control means producing the second signal when the first signal is produced by the sensor means after the supply means is actuated by the control means.

4,178,596

RADAR AUGMENTATION SYSTEM FOR AIRBORNE TARGET

Robert P. Rowlett, Thousand Oaks, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jul. 19, 1978, Ser. No. 925,988
Int. Cl.[2] G01S 7/38; H01Q 1/28
U.S. Cl. 343—18 E 4 Claims



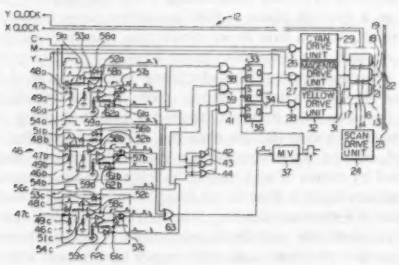
1. An active radar augmentation system for reducing aerial target losses from hits of radar guided missiles, comprising:
a. a receiving antenna in the forward portion of the target for receiving radar signals from an attacking missile system;
b. an amplifier connected to said receiving antenna; and
c. a transmitting antenna connected to the output of said amplifier for transmitting said radar signals as a return to the missile, said transmitting antenna mounted in a rearward location on said target in position to transmit over a wide unimpeded zone, whereby the radar guided missiles are guided by return signals from the rear area of said target and thus tend to pass behind said target.

4,178,597

COLOR INK JET PRINTING APPARATUS

Takuro Isayama, and Hiromichi Komai, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,552
Claims priority, application Japan, Jun. 6, 1977, 52-66554
Int. Cl.[2] G01G 15/18
U.S. Cl. 346—75 6 Claims



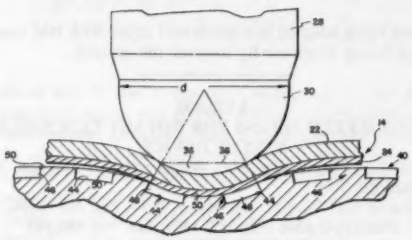
1. An ink jet printing apparatus comprising:
a first ink ejector for ejecting a first ink jet of a first color onto a sheet in response to a first electrical signal;
a second ejector for ejecting a second ink jet of a second color onto the sheet in superposition with the first ink jet in response to a second electrical signal;
drive means for producing relative movement between the first and second ink ejectors and the sheet; and
circuit means for sensing simultaneous initiation of the first signal and termination of the second signal and reducing an amount of ink ejection from the first ejector for a predetermined length of time in response thereto; the circuit means further sensing simultaneous initiation of the second signal and termination of the first signal and reducing an amount of ink ejection from the second ejector for the predetermined length of time in response thereto.

4,178,598

TRANSFER OR RECORDING SHEET HAVING A TEXTURED SURFACE

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 1, 1978, Ser. No. 911,346
Int. Cl.[2] G01D 15/20
U.S. Cl. 346—105 5 Claims



1. In a printing system comprising a ball stylus having a given diameter, a transfer sheet having at least one surface coated with a printing medium, a recording sheet having at least one surface configured for receiving said printing medium, means for positioning said transfer and recording sheets with their said one surfaces in overlying relation, and means for repeatedly bringing said ball stylus into contact with portions of a surface of said transfer sheet opposite said one surface in an image forming program to thereby selectively transfer said printing medium from predetermined areas of said coating, established in response to each such contact by said ball stylus and ranging from minimum to maximum predetermined areas related in size to said given diameter of said ball stylus, to said one surface of said recording sheet to form marks thereon in an image forming relationship, the improvement wherein said one surface of at least one of said transfer and recording sheets is provided by a plurality of orderly spaced mesas, each of which includes a mesa surface that is smaller in area than said minimum predetermined area, and recessed areas in between said mesas thereby providing a wide range of image density in said printing system.

4,178,599

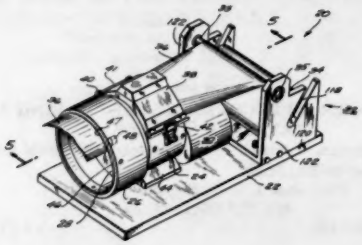
MOUNTING STRUCTURE FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551.
This application Mar. 22, 1978, Ser. No. 888,964
Int. Cl.[2] G01D 15/08
U.S. Cl. 346—163 4 Claims

1. In or for a rotary electrical printer for forming images on electro-responsive recording paper having an opaque coating over a coating including a curved platen, a rotor, a plurality of styli mounted on said rotor to sweep across said platen when said rotor rotates, electrical energization means for selectively energizing said styli to cause said opaque coating to be selectively eroded away, and feed means for feeding said recording paper between said platen and said styli with said styli brushing

across said opaque coating, and a support member, said platen and rotor being mounted on said support member, said support member being adapted to support said paper with said opaque coating facing downwardly towards the ground.



4,178,600

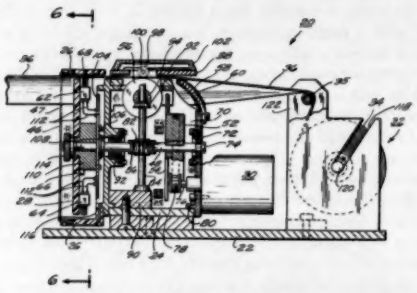
RECORD FEED MEANS FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,965

Int. Cl.[2] G03G *17/00*; G01D *15/08*

U.S. Cl. 346—163 **8 Claims**



1. In a rotary electrical device including a rotor, a plurality of styli on said rotor, means for selectively energizing said styli to transcribe indicia on recording paper, a rounded housing having an opening, a shaft extending axially in said housing for rotatably supporting said rotor, a motor coupled to rotate said shaft, a paper feed roller mounted in said housing with one edge extending adjacent said opening, drive coupling means for drivably coupling said feed roller to said shaft, and curved guide means opposite said roller for guiding a strip of recording paper across the outside of said housing in arcuate form.

4,178,601

RECORD DRIVE MEANS FOR ROTARY ELECTRICAL STYLUS DEVICE

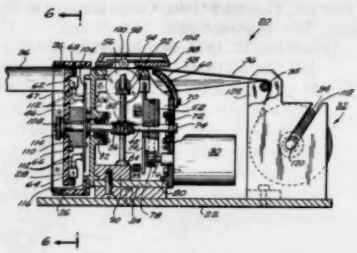
Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,968

Int. Cl.[2] G03G *15/00*; G01D *15/08*; B65H *23/02*

U.S. Cl. 346—163 **5 Claims**

1. In or for a rotary device including a rotor, a curved platen, a plurality of styli for transcribing indicia on a record sheet, said styli being secured to said rotor, support means for supporting said platen in a position such that said styli sweep over said platen when said rotor rotates, feed means for feeding a relatively thin elongated record sheet longitudinally between said styli and said platen, said feed means including guide means for curving said record sheet into an arcuate form, and drive means located closely adjacent said platen for pushing said sheet towards said platen at a point at which said sheet has said arcuate form.



4,178,602

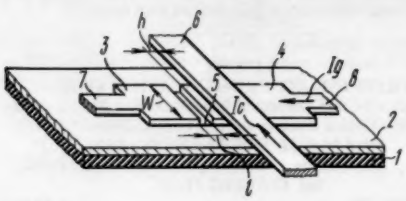
THIN FILM CRYOTRON

Petr E. Kandyba, korpus 438, kv. 11; Dmitry P. Kolesnikov, korpus 301 b, kv. 111; Nina I. Komarovskikh, korpus 431, kv. 116; Gennady M. Lapir, korpus 851, kv. 69; Konstantin K. Likharev, Leninsky prospekt, 93, kv. 200; Vadim A. Ryzhkov, korpus 331, kv. 87, and Viktor G. Yastrebov, korpus 909, kv. 122, all of Moscow, U.S.S.R.

Filed Aug. 31, 1977, Ser. No. 829,527

Int. Cl.[2] H01L *27/12*

U.S. Cl. 357—4 **8 Claims**



1. A thin-film cryotron comprising: a superconducting layer serving as a ground plane; a first insulation layer located on said ground plane; a first superconducting thin-film electrode located on said first insulation layer having a lead-in path; a second superconducting film electrode located on said first insulation layer having a lead-in path; a first conducting jumper between said first and second superconducting electrodes made of a film thinner than that of said electrodes, said first and second superconducting electrodes being weakly connected by means of said jumper to form a bridge of variable thickness serving as a distributed Josephson junction; a control line made of a superconducting thin film strip located above a respective electrode and displaced from a boundary between said respective electrode and said jumper by distance less than the width of said jumper.

4,178,603

SCHOTTKY TRANSISTOR WITH LOW RESIDUAL VOLTAGE

Gerald Müendel, Glonn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,939

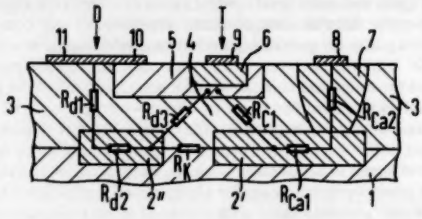
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639799

Int. Cl.[2] H01L *29/48*

U.S. Cl. 357—15 **9 Claims**

1. In a transistor structure having a planar transistor and a

Schottky diode combined in a common semiconductor crystal, said transistor having base, emitter and collector zones, and said Schottky diode being connected between said base and collector zones by means of a doped buried layer zone, the



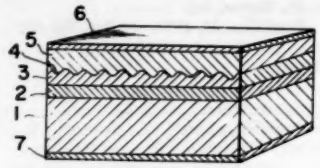
improvement comprising said buried layer zone having a pair of doped regions of one conductivity separated by a region of lesser conductivity to reduce the coupling between the diode and the transistor.

4,178,604

SEMICONDUCTOR LASER DEVICE

Michiharu Nakamura, Tokyo, and Junichi Umeda, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 608,342, Aug. 27, 1975, abandoned, which is a continuation of Ser. No. 512,969, Oct. 7, 1974, abandoned. This application Oct. 6, 1977, Ser. No. 839,770
Claims priority, application Japan, Oct. 5, 1973, 48-111454
Int. Cl.[2] H01S *3/19*; H01L *29/205*
U.S. Cl. 357—18 **102 Claims**



1. A semiconductor laser device comprising:
a semiconductor body of a first conductivity type having a major surface;
a laser active semiconductor layer, disposed on said major surface of said body;
a first semiconductor layer of a second conductivity type, opposite said first conductivity type, and having a thickness in the range from 500 Å to 0.5 μm and an index of refraction lower than that of said laser active layer, disposed on said laser active layer, the surface of said first semiconductor layer opposite that disposed on said laser active layer being corrugated; and
a second semiconductor layer of said second conductivity type, disposed on the corrugated surface of said first semiconductor layer and having an index of refraction lower than that of said first semiconductor layer.

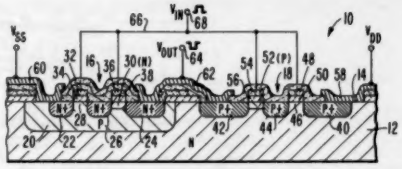
4,178,605

COMPLEMENTARY MOS INVERTER STRUCTURE

Sheng T. Hsu, Lawrenceville, N.J., and James M. Cartwright, Jr., Cambria Heights, N.Y., assignors to RCA Corp., New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,593
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—42 **10 Claims**

1. An improved complementary MOS inverter structure having N channel insulated gate field effect transistor means with source, drain, channel, and gate electrode means; P channel insulated gate field effect transistor means with source, drain, channel, and gate electrode means; means for applying a first supply voltage to the source of the P channel insulated gate field effect transistor means; means for applying a second supply voltage to the source of the N channel insulated gate field effect transistor means; means for connecting the drains of the N and P channel insulated gate field effect transistor means in common; and means for connecting the gate electrode means of the N and P channel insulated gate field effect transistor means in common, wherein the improvement comprises:



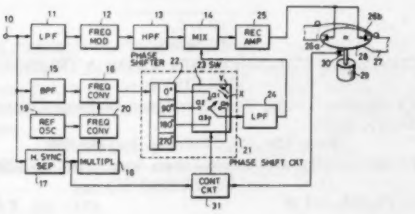
each of said N and P channel insulated gate field effect transistor means comprising a series combination of an enhancement channel having a predetermined threshold for conduction and a channel having a threshold for conduction lower than that of the enhancement channel, the lower threshold channel of each insulated gate field effect transistor means being adjacent the respective drain thereof.

4,178,606

COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING SYSTEM

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 13, 1976, Ser. No. 731,935
Claims priority, application Japan, Oct. 17, 1975, 50-124311; Jan. 30, 1976, 51-8937
Int. Cl.[2] H04N *5/79*
U.S. Cl. 358—4 **25 Claims**

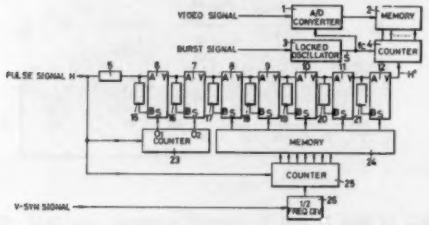


22. A system for recording a composite color television signal on a plurality of tracks along a record medium, said signal including chrominance signal components representative of image information during recurring line and field intervals, said system comprising:
means for generating first and second reference signals, said first reference signal progressing in phase at a rate corresponding to said line interval, and said second reference signal regressing in phase at a rate corresponding to said line interval;
means for combining said chrominance signal components during traversal of adjacent ones of said tracks alternately with said first and second reference signals; and
means for recording said combined signal on said record medium.

4,178,607
PAL COLOR TELEVISION SIGNAL GENERATOR FOR CONTROL OF TIME BASE CORRECTOR

Tsuneo Mikado, Tokyo, Japan, assignor to Nippon Television Industry Corporation, Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,536
Claims priority, application Japan, Nov. 5, 1976, 51-133528
Int. Cl.[2] H04N 5/795
U.S. Cl. 358—8 21 Claims



9. A video signal processing apparatus comprising:

(a) a video signal processing circuit for processing video signal on the basis of predetermined clock pulses;

(b) a timing signal generating circuit including:

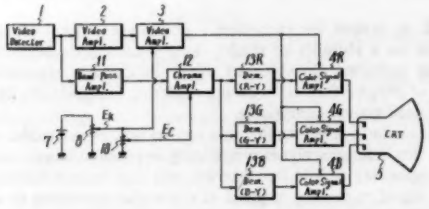
(i) a delay circuit for delaying a pulse signal synchronized with a horizontal synchronizing signal in said video signal, the delay time of said delay circuit being controllable; and

(ii) a counter for counting said pulse signal synchronized with the horizontal synchronizing signal, the delay time of said delay circuit being changed at every horizontal period in a predetermined periodical sequence in accordance with the counting output of said counter; whereby a timing signal is obtained from said delay circuit having a frequency which is substantially 1/n (n: integer) times as high as the frequency of said clock pulses and is not integrally related to the frequency of said pulse signal synchronized with the horizontal synchronizing signal, and said video signal processing circuit is provided with said timing signal to process the video signal at every corrected horizontal period corresponding to said frequency of 1/n times as high as the frequency of said clock pulses.

4,178,608
CONTRAST/COLOR CONTROL FOR A TELEVISION RECEIVER

Keiji Shirato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,550
Claims priority, application Japan, Apr. 7, 1977, 52-39686
Int. Cl.[2] H04N 9/12
U.S. Cl. 358—21 R 9 Claims

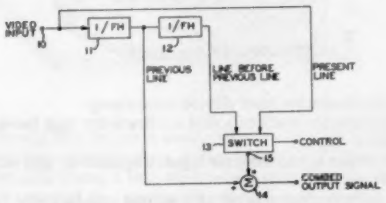


1. In television receiving apparatus of the type having a controllable video amplifier for amplifying a luminance signal and a controllable chrominance amplifier for amplifying a chrominance signal, control circuitry for selectively controlling the contrast of a video picture displayed by said television receiving apparatus and for selectively controlling the color level of said video picture comprising pulse generating means for generating contrast control pulses of selectively variable duty cycle and color level control pulses of selectively variable duty cycle; contrast control means responsive to said contrast control pulses for generating a contrast control signal in accordance with the duty cycle of said contrast control pulses; means for using said contrast control signal to control the gain of said video amplifier so as to correspondingly control the contrast of said video picture; color control means responsive to said color level control pulses for generating a color level control signal in accordance with the duty cycle of said color level control pulses; means for changing said color level control signal proportionally with a change in said contrast control signal so as to maintain a substantially constant chrominance-to-luminance signal ratio despite changes in said contrast control signal; and means for using said color level control signal to control the gain of said chrominance amplifier so as to correspondingly control the color level of said video picture.

4,178,609
COMB FILTER HAVING IMPROVED LUMINANCE RESPONSE

Robert C. Beutel, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Oct. 25, 1977, Ser. No. 845,002
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—31 3 Claims



1. In a picture display system whereby an image is formed from a series of consecutive raster lines formed on a television picture tube, said lines having associated therewith a composite video signal for identifying the color and brightness of said lines whereby said color is represented by a chroma signal and said brightness is represented by a luminance signal, said luminance and chroma signals having an interleaved frequency spectrum, means for removing said luminance signal from said video signal comprising:

a. means for supplying a first video signal representing a first raster line;

b. means for supplying a second video signal representing a second raster line;

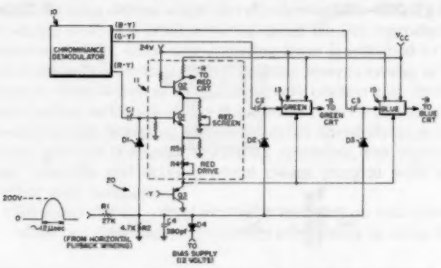
c. means for supplying a third video signal representing a raster line produced previous to said first raster line; and

d. means for selectively combining said second and third video signals with said first video signal, only said second video signal being combined with said first video signal when said first and second raster lines are correlated, and only said third video signal being combined with said first video signal in the absence of correlation between said first and second raster lines whereby a luminance signal is produced.

4,178,610
CLAMP CIRCUIT FOR RGB OUTPUT STAGES

Douglas W. Constable, and John D. Lovely, both of Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 17, 1978, Ser. No. 878,695
Int. Cl.[2] H04N 5/16
U.S. Cl. 358—34 9 Claims



1. In a television receiver having a plurality of signals AC coupled from the output of a chrominance demodulator to the inputs of respective chrominance amplifiers, a clamp circuit comprising:

voltage dividing means coupled to a source of pulses characterized by an amplitude, A, and a pulsewidth, T, for dividing said pulses by a factor, K;

a plurality of clamping diodes having common ends coupled to the output of the dividing means and other ends separately connected to respective inputs of the chrominance amplifiers and capacitively coupled to associated signal outputs of the chrominance demodulator;

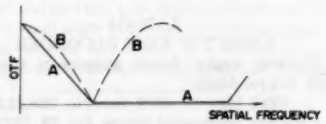
diode means having one end coupled to the output of the dividing means; and

a bias supply characterized by an amplitude B and coupled to another end of the diode means whereby a clamping period is established, said clamping period having a duration less than T by a factor directly related to K and inversely related to the ratio of A to B.

4,178,611
OPTICAL LOW PASS FILTER

Yukio Okano, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1978, Ser. No. 889,011
Claims priority, application Japan, Mar. 26, 1977, 52-33784
Int. Cl.[2] H04N 9/06
U.S. Cl. 358—44 12 Claims



1. In an optical system for a color television camera system including a spatial color encoding filter disposed in the light path of said optical system and serving to modulate at least two color images, the optical system comprising a photoelectric converting member for generating electrical signals corresponding to said images, an objective lens disposed in front of said photoelectric converting member to focus an image of an object thereon, and a phase grating filter member disposed between the object and said photoelectric converting member and having the configuration of a triangular wave in cross section taken along at least one direction, in which the height, d of the triangular wave is within a range defined by the following formula:

$$\left|\frac{0.75\,\lambda}{2\,(n-n')}\right| \leqq d \leqq \left|\frac{1.45\,\lambda}{2\,(n-n')}\right|$$

wherein

n = refractive index of the filter material,

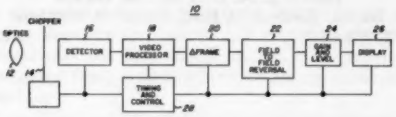
n′ = refractive index of the medium bordering the surface of the grating, and

λ = wave length of the light affected by passing through the filter member.

4,178,612
DELTA FRAME CIRCUIT

Dana Dudley, Dallas, and William M. Knight, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 21, 1978, Ser. No. 926,991
Int. Cl.[2] H04N 5/21, 5/30
U.S. Cl. 358—167 12 Claims

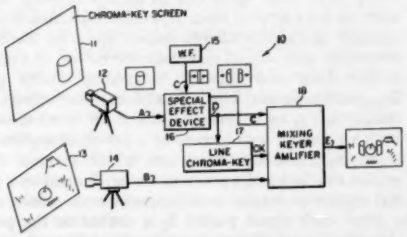


2. A circuit for removing offset voltages from video signals comprising: X and Y address means, an array of difference frame elements having terminals for connection to a source of video signals, a multiplexer, a voltage reference switch having an input terminal for connection to a reference voltage source, and an output amplifier, said X and Y address means operatively connected to the array of difference frame elements and multiplexer to address sequentially each element of the array of difference frame elements and multiplexer for connecting sequentially each element to the video signal terminal and multiplexer, said multiplexer having input terminals for connecting each element of rows of difference frame elements sequentially to the reference voltage switch and to the output amplifier whereby offset voltages of succeeding video frames are cancelled from the video signals.

4,178,613
TELEVISION PICTURE SPECIAL EFFECTS SYSTEM USING DIGITAL MEMORY TECHNIQUES

Ryosuke Takahashi; Masao Inaba, and Masashi Onosato, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1977, Ser. No. 839,212
Claims priority, application Japan, Oct. 5, 1976, 51-119950
Int. Cl.[2] H04N 9/535, 5/22, 5/76
U.S. Cl. 358—183 11 Claims



1. A special effects system for a television signal, said television signal including horizontal and vertical synchronizing signals, said system comprising:

memory means responsive to a write-in address signal for storing said television signal;

means responsive to said horizontal and vertical synchronizing signals for producing said write-in address signal;

means for producing a read-out address signal, the stored television signal being read out in response to said readout address signal;

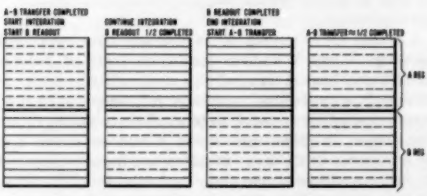
means responsive to a control signal for controlling at least one of said write-in and read-out address signals, said controlling means including means responsive to said control signal for producing a full control width signal representing the width of said control signal, means responsive to said full control width signal for producing a half control width signal representing a half of the width of said control signal, and means for adding said half control width signal to at least one of said address signals.

4,178,614

READOUT OF A DENSELY PACKED CCD

Donald J. Sauer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,524
Int. Cl.[2] H04N *3/14;* **H01L** *27/10, 29/78, 31/10*
U.S. Cl. 358—213 **5 Claims**



1. In a charge-coupled device (CCD) which includes a substrate and overlying electrode means insulated from the substrate for creating potential wells in the substrate for the propagation and storage of signal charge packets in response to applied voltages, and in which there are initially stored in n adjacent ones of said potential wells each separated from an adjacent potential well by a space only occupied by a potential barrier in said substrate created by a single one of said electrode means, n signal charge packets $S_1, S_2 \ldots S_n$, respectively, and in which it is desired to shift said signal charge packets in a direction such that the charge packet S_1 is the leading or first charge packet and S_n the last charge packet, a method for shifting the charges comprising the steps of applying potentials to said electrode means for:

(a) starting with the signal charge packet $S_j = S_1$, sequentially, successively shifting during n successive time periods, the n successive charge packets $S_1, S_2 \ldots S_n$, respectively, each such signal charge packet S_j being shifted, when its turn arrives, from a position separated from the adjacent succeeding charge packet $S_{(j+1)}$ by the barrier created by only one of said electrode means, to a position further from said adjacent succeeding charge packet $S_{(j+1)}$ and separated from said adjacent succeeding charge packet $S_{(j+1)}$ by a space sufficient for accommodating both a potential well formed by a potential applied to an overlying electrode means into which a signal charge packet can flow and a potential barrier formed by a potential applied to another overlying electrode means; and

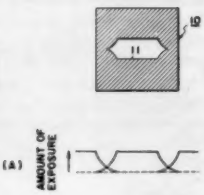
(b) when each signal packet S_j is shifted to the position described in (a) above, concurrently shifting through an equal distance, in the same direction, the preceding signal charge packets $S_{(j-1)}, S_{(j-2)} \ldots S_1$, if any such charge packets $S_{(j-1)} \ldots S_1$ are present.

4,178,615

APERTURE PLATE FOR AN EXPOSURE HEAD FOR USE IN A PICTURE SCANNING REPRODUCER

Riyo Shimooka, Kyoto; Masuo Kunisawa, Uji, and Seiji Okazaki, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 28, 1977, Ser. No. 855,472
Claims priority, application Japan, Nov. 30, 1976, 51-160331
Int. Cl.[2] H04N *1/22;* **G11B** *7/18;* **G03B** *27/50, 27/68*
U.S. Cl. 358—302 **3 Claims**



1. An exposure head of a picture scanning reproducer which traces scanning lines on a recording medium, comprising,

an intensity modulated light source element, a condenser lens element, an aperture plate element having an aperture therethrough, and a focusing lens element, said elements being arranged substantially co-axially in series and adapted to be positioned relative to the recording medium such that a light beam directed from said light source through said aperture is focused upon the recording medium,

said aperture having a shape delimited by:

an edge leading with respect to the scanning direction and an edge trailing with respect to the scanning direction which are parallel straight lines in the feed direction perpendicular to the scanning direction; and

end edges joining the ends of these leading and trailing edges, said end edges being curves oppositely and symmetrically disposed to one another with respect to the scan direction, and each of said end edges being composed of first and second lines which start from a mutually defined cusp and open up away from one another in the direction away from the cusp so that the angle between the tangents to them increases, the farther away from the cusp whereby the exposure distribution in the feed direction when each scanning line is exposed defines exponentially shaped curves in both of its ends corresponding to the exponentially shaped curves of the aperture to obtain a uniform concentration value distribution in the feed direction due to the overlapping of the exponentially shaped curves on the recording medium.

4,178,616

CASSETTE TAPE RECORDER

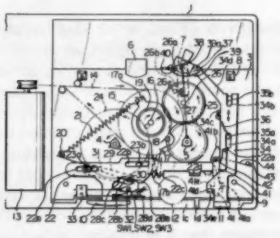
Kazumi Fukawa, Asaka, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,212
Claims priority, application Japan, Jul. 29, 1977, 52-091089
Int. Cl.[2] G11B *15/48, 15/18*
U.S. Cl. 360—74.1 **8 Claims**

1. In a cassette tape recorder capable of manually switching the operation thereof to any one of a stop position, a reproducing position, a quick winding position and a quick rewinding position and having a manually operable actuating lever for switching the position of operation of the tape recorder, a swingable switching lever coupled with said actuating lever, a driving shaft mounted on said actuating lever and driving wheel means integral with said driving shaft and driven by a driving motor adapted to rotate in a predetermined direction, a winding reel mounting shaft having a frictionally driven wheel integral therewith and a supply or rewinding reel mounting shaft having a driven gear integral therewith which

is coupled with an idler wheel means, said idler wheel means being located at a position opposite to said frictionally driven wheel with respect to said driving shaft integral with said driving wheel means, said driving shaft and said driving wheel means being held disengaged from said frictionally driven wheel or said idler wheel means at the stop position of said actuating lever, but, when said actuating lever is switched to the reproducing position, said switching lever is swung in one direction so as to compressively contact said driving shaft with said frictionally driven wheel thereby driving said winding reel mounting shaft at a predetermined speed for the reproducing operation, while, when said actuating lever is switched to the quick rewinding position, said switching lever is swung in the opposite direction so as to compressively contact said driving wheel means with said idler wheel means thereby driving said rewinding reel mounting shaft at a higher speed through said driven gear for the quick rewinding operation, the improvement wherein said driving wheel means integral with said driving shaft comprises:

a frictional driving wheel integrally mounted on said driving shaft and said idler wheel means comprising an idler friction wheel and an idler gear integral with said idler friction wheel;



said idler friction wheel being adapted to engage with said frictional driving wheel at the rewinding position of said actuating lever and said idler gear meshing with said driven gear of said rewinding reel mounting shaft thereby permitting said rewinding reel mounting shaft to be frictionally driven through said idler friction wheel for the quick rewinding operation, and

means ensuring positive power transmission between said frictionally driven wheel and said idler friction wheel being ensured even with small engaging forces, including:

a swingable switching lever shaft for swingably supporting said swingable switching lever, such that a first line passing through the cengers of said swingable lever shaft and said rewinding reel supporting shaft, and

an idle gear shaft carried by said swingable lever, such that a second line passing through the centers of said swingable lever shaft and said idle gear shaft are displaced from each other by a small angle θ, so that the positive power transmission is ensured and results in a driving-in tendency even though the aforesaid engaging forces are small.

4,178,617

SUPPRESSOR-INSULATOR MEMBER AND CIRCUIT ARRANGEMENT THEREFOR

Alfred G. Reichel, Wallrabenstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 16, 1977, Ser. No. 851,873

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700388; Jan. 7, 1977, 7700253

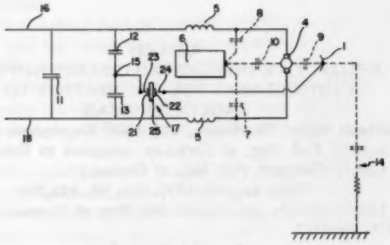
Int. Cl.[2] H02H *1/02*

U.S. Cl. 361—43 **12 Claims**

7. In a portable, hand-held, electric-powered tool such as a double-insulated tool or the like having an exposed-metal part accessible to an operator of the tool and being equipped with input current supply means, an arrangement for suppressing asymmetrical noise in the tool and electrically isolating the exposed-metal part from the electrically conductive parts within the tool comprising:

filter means for conducting the asymmetrical noise and being connected across the input current supply means; and,

a suppressor-insulator member for conducting said asymmetrical noise away from said filter means, said suppressor-insulator including:



two electrodes and an electrically insulating structure disposed therebetween, one of said electrodes being connected into said filter means and the other one of said electrodes being connected to the exposed-metal part of the tool;

said insulating structure defining a creep-path between said electrodes of sufficient length to electrically isolate the exposed metal part from the input-current supply means in the event of a short-circuit failure in said filter means.

4,178,618

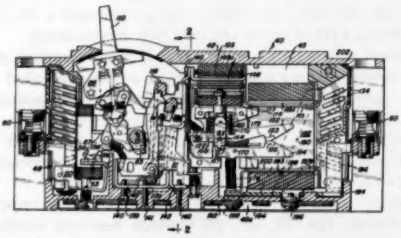
CURRENT LIMITING CIRCUIT BREAKER

Joseph M. Khalid, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 647,823, Jan. 9, 1976, Pat. No. 4,070,641, which is a continuation-in-part of Ser. No. 465,012, Apr. 29, 1974, Pat. No. 3,943,473. This application Aug. 15, 1977, Ser. No. 824,588

Int. Cl.[2] H02H *7/22*

U.S. Cl. 361—58 **10 Claims**



1. A current limiting resistor shunted by a pair of engaged contacts in a circuit breaker adapted to be separated in response to a fault current for directing said fault current through said resistor to a low resistance conductor with said fault current having sufficient magnitude to rupture a direct connection between said resistor and said conductor, the improvement comprising;

a wire of a material having a positive temperature coefficient of resistance to create a relatively high value of volume resistivity in response to the passage of said fault current through said wire,

and blowout preventive terminal end means having a volume resistivity intermediate the volume resistivity of said wire and the volume resistivity of said low resistance conductor interconnecting said wire to said low resistance

conductor through a path avoiding undue conduction constriction of said fault current.

4,178,619

PROTECTIVE INTEGRATED CIRCUIT NETWORK, PARTICULARLY FOR CONNECTION TO AN INDUCTIVE LOAD

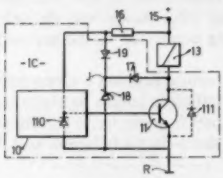
Hartmut Seiler, Reutlingen, and Adolf Kugelmann, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,286

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638177

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—91 **17 Claims**



1. Reverse polarity and excess voltage protected integrated circuit network in combination with and to control connection to an unbypassed load (**13**), particularly an unbypassed inductive load which is coupled to a power source (**15**), to protect an integrated load switching control circuit for said load against voltage surges and reverse polarity, said integrated circuit having

a controlled semiconductor switch (**11**), serially connectable with the load (**13**) and the power source (**15**);

a current limiting resistor (**16**) having at least first and second terminals, one terminal being connected to the power source (**15**) to which the load (**13**) is connected;

control means (**10**) coupled to said other terminal of said current limiting resistor (**16**) and to the controlled semiconductor switch (**11**) for controlling the conduction state of said controlled semiconductor switch (**11**);

and a protective circuit connected in parallel to the main current switching path of the controlled semiconductor switch (**11**) comprising

a series circuit having a diode (**17**), and a voltage responsive element (**18**, **20**, **20'**, **20''**) which becomes conductive when the voltage thereacross exceeds a predetermined limit, the diode and the voltage responsive element having a common junction (J) therebetween, said common junction (J) being coupled to said other terminal of said current limiting resistor (**16**), said series circuit (**17**; **18**, **20**) in parallel to the switching path of the controlled semiconductor switch (**11**) becoming conductive upon presence of a reverse voltage in excess of the breakdown voltage and the voltage drop across the load upon disconnection of the load, or application of reverse polarity due to improper poling of said source and limiting the voltage across the main current switching path of the controlled semiconductor switch to essentially said breakdown voltage and current flow through said controlled semiconductor switch and said protective circuit by the internal resistance of the load.

4,178,620

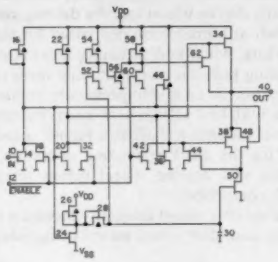
THREE STATE BUS DRIVER WITH PROTECTION CIRCUITRY

Steve K. Yu, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 11, 1977, Ser. No. 841,001

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—98 **10 Claims**



1. In a bus driver circuit of the kind having an input circuit for receiving an input logic signal, an output circuit including a push-pull field effect transistor pair for driving an output bus connected to a common junction of said transistor pair, each of said transistor pair having a gate, source, and drain, and means including at least one inverter stage coupled between said input circuit and said output circuit for translating said input logic signal from said input circuit to said output circuit and developing a three state logic output signal at said output bus, the improvement of means for limiting current flow through one of said transistors that is normally conducting when said output bus is short circuited from a normally HIGH logic level to a LOW logic level and for limiting current flow through the other one of said transistors that is normally conducting when said output bus is short circuited from a normally LOW logic level to a HIGH logic level, said current limiting means comprising:

a first field effect transistor having a source to drain circuit connected in shunt between the gate and source of said one transistor, second and third field effect transistors connected in series with each other at a common junction and in parallel with the source to drain circuit of said other one transistor, and a fourth field effect transistor connected in shunt between the gate and source of said other one transistor, each of said first, second, third and fourth transistors having a gate, source, and drain, means coupling the gate of said fourth transistor to the common junction of said second and third transistors, said first transistor being normally non-conducting and rendered conducting to reduce the gate drive to said one transistor when said output bus is short circuited from a normally HIGH logic level to a LOW logic level, and said fourth transistor being normally non-conducting and rendered conducting to reduce the gate drive to said other one transistor when said output bus is short circuited from a normally LOW logic level to a HIGH logic level, said first and fourth transistors returning to their respective non-conducting states when the short circuits are removed, thereby to preserve the logic information present on said output bus before it was short circuited.

4,178,621

ELECTROMECHANICAL PRESSURE TRANSDUCER

Joseph J. Simonelic, Huntsville, Ala., and Roland K. Ho, McHenry, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1978, Ser. No. 871,274

Int. Cl.[2] H01G *7/00*

U.S. Cl. 361—283 **8 Claims**

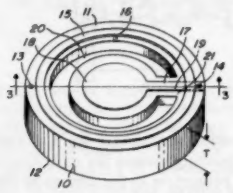
1. A pressure transducer in which pressure changes displace

a diaphragm whose position determines electrical characteristics of said transducer, comprising:

base substrate means having top and bottom substantially planar end surfaces;

flexible diaphragm means, relatively thin with respect to the distance between said top and bottom end surfaces, having a planar central portion and a peripheral portion; and

mounting means for mounting said peripheral portion of said diaphragm means to said base substrate top surface, said mounting means, said diaphragm planar central portion and said substrate top surface generally forming a sealed internal, substantially air tight cavity, a predetermined reference pressure being stored in said cavity, said base substantially thicker than said diaphragm means, said diaphragm central portion being displaceable with respect to said top surface in response to pressure changes, said base substrate means having at least one channel in the form of a surface groove in said substrate top surface



opening into said internal cavity, wherein said channel substantially increases the volume of said cavity and thereby permits said cavity to more readily maintain a predetermined reference pressure in said cavity for increasing the lifetime of the transducer despite any leakage of said reference pressure from said cavity;

said transducer including,

a first planar capacitor electrode mounted on said diaphragm central portion and a second planar electrode substantially mounted on a central planar portion of said substrate top surface, said electrodes being separated from each other by just a gap included in said internal cavity which contains a fixed predetermined reference pressure, the distance between said electrodes being determined by said mounting means, said electrodes forming a parallel plate capacitor with the capacitance created by said electrodes being altered in response to flexing said diaphragm means in response to pressure changes.

4,178,622

COMPACT, FLAT TRIMMER CAPACITORS

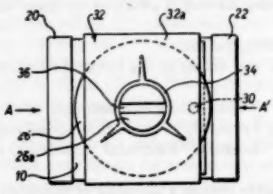
Robert F. Oxley, 8 rue Pedro-Meylan, Geneva 1208, Switzerland

Filed Aug. 29, 1977, Ser. No. 828,706

Claims priority, application United Kingdom, Sep. 18, 1976, 38796/76

Int. Cl.[2] H01G 5/04

U.S. Cl. 361—293 **9 Claims**



1. A trimmer capacitor comprising in combination:

(a) a base member of electrically insulating material having at least one flat side surface;

(b) a pair of uniformly spaced apart, flat, metallic electrodes carried by said base member in a common plane parallel to said flat side surface of the base member;

(c) a shuttle member defining a third flat metallic electrode;

(d) means mounting said shuttle member on said flat surface of the base member for slidable displacement along a linear path;

(e) means electrically insulating the third electrode from the electrodes carried by said base;

(f) a disc member;

(g) clip means engaging the base member and disc member and mounting said disc member over said shuttle member such that said disc member is rotatable about its axis in a plane parallel to the shuttle member but is constrained from axial and transverse movement relative to said base member;

(h) means defining a spiral-like groove in the underside of said disc;

(i) a projection member which is carried by the shuttle and is slidably received in said groove whereby rotation of the disc causes the projection to move along the groove and hence the shuttle to be displaced along said path relative to the base member and the fixed electrodes carried thereby; and

(j) a pair of end terminations disposed at opposite ends of the base member and respectively electrically connected to said electrodes carried by said base member.

4,178,623

MEASURING SENSOR FOR CAPACITIVE MEASUREMENT OF LIQUIDS AT SELECTED LEVELS

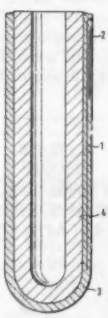
Bernd W. Emmerich, Bruehl; Rudolf Ehret, St. Augustin; Gerhard Hoyer, and Hans R. Trampert, both of Oftersheim, all of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,511

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717301

Int. Cl.[2] H01G 7/00

U.S. Cl. 361—284 **4 Claims**



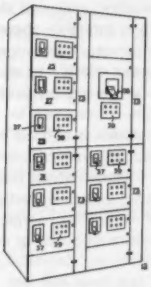
1. An improved measuring sensor for capacitive measuring of liquid level in a vessel of the type having a first electrode band embedded in an enamel layer of a steel body serving as an opposite electrode, and where at least part of the capacitance between the first electrode band and the steel body is a function of the dielectric effects of a liquid in electrical proximity to the first electrode band, wherein the improvement comprises a metallic screening band (2) which is wider than the first electrode band and which is embedded in the enamel layer (3) between the first electrode band (1) and the enamel surface, said screening band covering only a portion of the first electrical band providing a screened range of the first electrode band shielded from the dielectric effects of liquid and an unscreened range so that only liquid levels corresponding to the unscreened range affect the capacitance of the sensor.

4,178,624

CONTROL CENTER WITH INSULATED BUS BARS

John R. Wilson, Darien; Neal E. Rowe, Bremen Township, Cook County, and Brij M. Bharteey, Bolingbrook, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 612,606, Sep. 11, 1975, abandoned. This application May 2, 1977, Ser. No. 792,837
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—341 3 Claims



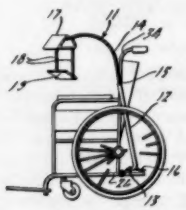
1. A control center for distributing electric power from a power supply source to power consuming devices, comprising a cabinet having a frame providing a compartment on the front side of the cabinet, a plurality of vertical bus bars in said cabinet, a barrier encasing the bus bars and being substantially coextensive therewith and consisting essentially of an electrically insulative material, at least one circuit interrupter in the compartment and having a conductor extending therefrom, the barrier having removable integral surface knockout sections adjacent to the bus bars to provide access to effect connection of the conductor to the bus bar, the knockout sections being demarked from the remainder of the barrier by a zone of reduced thickness, the knockout sections being surrounded by flanges extending from the planar area of the barrier on the side opposite the bus bars, and the barrier and the bus bars being almost completely in surface-to-surface contact with each other and without spacing therebetween except for the locations of the knockout sections when the knockout sections are removed to promote better heat conduction from the bus bars and through the barrier.

4,178,625

LAMP

Marcus T. Schudel, 1313 Maple Blvd., Monroe, Mich. 48161

Filed May 25, 1978, Ser. No. 909,198
Int. Cl.[2] A47B 97/00
U.S. Cl. 362—131 13 Claims



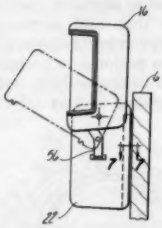
1. A lamp unit embodying a solid tube section, a flexible tube section extending from within said solid tube section outwardly thereof, the bottom of the solid tube section being bent at an angle and flattened, a flat finger extendable into the tube flattened end, a support for said flattened finger, said support being engageable with a supporting element, and means for securing said support in fixed relation to said supporting element with the flat finger parallel to and spaced from said support.

4,178,626

DRAWER LIGHT

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 17, 1978, Ser. No. 896,986
Int. Cl.[2] F21V 33/00
U.S. Cl. 362—133 8 Claims



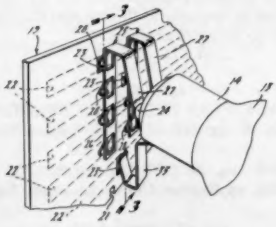
1. An illumination mechanism for a drawer comprising in combination: a housing, means for mounting said housing to a support surface proximate to the area to be illuminated, a lamp assembly pivoted to said housing for rotation between an active position facing said area to be illuminated, and an inactive position facing said support surface, a source of power in said housing, and electrical circuit means between said source and said lamp assembly for energizing the latter when in said active position.

4,178,627

LAMP ASSEMBLY

Erwin L. Baumann, Laguna Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Jan. 5, 1978, Ser. No. 867,213
Int. Cl.[2] F21V 11/00
U.S. Cl. 362—240 6 Claims



1. A lamp assembly comprising:
a lamp housing having a plurality of light bulb receiving sockets,
an electric ribbon cable,
an elongated slot means in the housing receiving the ribbon cable,
the ribbon cable consisting of a laminate of dielectric material having a plurality of parallel, longitudinally extending, mutually isolated, electrical conductors embedded therein,
the ribbon cable having a plurality of windows in its surface to expose contact surfaces on the conductors,
key slot means longitudinally locating the ribbon cable in the elongated slot means to align each window and thereby a related exposed contact surface with a specific light bulb socket,

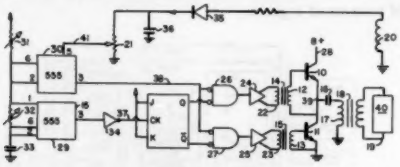
and contact means retained within the housing extending from the exposed contact surface on the specific conductor to the specific light bulb socket.

4,178,628

SWITCHING TYPE REGULATED POWER SUPPLY

Francis H. Shepard, Jr., Summit, N.J., assignor to R & I Patent Corporation, Morristown, N.J.

Filed May 12, 1978, Ser. No. 905,232
Int. Cl.[2] H02M *1/08*
U.S. Cl. 363—25 **12 Claims**



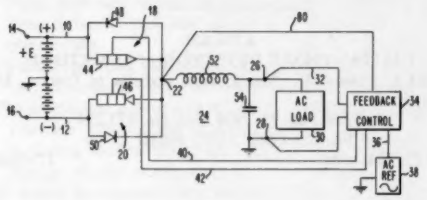
1. A switching type power supply, comprising:
a transformer having primary and secondary windings;
means for coupling said secondary winding to a load;
first and second alternately conductive semiconductor switching elements coupled in circuit with said primary winding, each of said elements having two main electrodes and a control electrode;
the main electrodes of said first element being connected in a first circuit path for supplying current to said primary winding from a source of potential difference during first recurrent time intervals;
the main electrodes of said second element being connected in a second circuit path to permit current flow through said primary winding during second recurrent time intervals when said first circuit path is open; and
a switching control circuit for providing first periodic switching signals to the control electrode of said first element during said first intervals and second periodic switching signals to the control electrode of said second element during said second intervals, said first and second switching signals being noncoincident, the dead time between successive ones of said first and second signals having a predetermined minimum value established by a given resistance-capacitance timing circuit, said circuit comprising (i) a first multivibrator circuit including said given timing circuit having a first output terminal for generating periodic first control pulses having a predetermined width, (ii) a second circuit synchronously coupled to said first multivibrator circuit and having a second output terminal for generating periodic second control pulses having a width at all times not exceeding the width of said first control pulses, (iii) a common resistance—capacitance timing circuit for both of said circuits, such that said first and second control pulses are mutually synchronized, with the leading edges of the first control pulses occurring coincident with the leading edges of the second control pulses, (iv) a bistable circuit having a clock switching terminal and first and second oppositely phased switch control terminals, (v) means for connecting said first output terminal of said first multivibrator circuit to said clock switching terminal, (vi) means for connecting said first control terminal as as input to a first AND circuit and said second control terminal as an input to a second AND circuit, (vii) means for connecting said second output terminal of said second circuit as another input to each of said AND circuits, and (viii) means for coupling the output of said first AND circuit to the control electrode of one of said switching elements and the output of the second AND circuit to the control electrode of the other of said switching elements.

4,178,629

D. C. POWERED A. C. SUPPLY FOR REACTIVE LOADS

George W. Allen, Rhinebeck, and Bruce C. Felton, Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 772,784, Feb. 28, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,142
Int. Cl.[2] H02M *7/515, 7/537*
U.S. Cl. 363—96 **8 Claims**



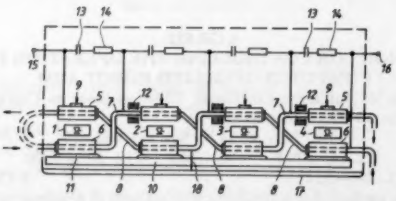
1. A power supply comprising:
direct current source/sink means,
a pair of output terminals for connection to a load,
bi-directional circuit means connected between said source/sink means and said output terminals;
voltage reference means having an output wave form comprising at least an alternating current component,
and feedback means responsive to deviation of the voltage across said output terminals in comparison to the wave form of said reference,
the current source/sink means being responsive to said feedback means to feed current to and accept current from said circuit means, the source/sink means being operative in alternation at a frequency which is high compared to tha of said reference wave form,
wherein said feedback means is operative to provide a feedback signal having a first component which is directly proportional to the error between the voltage across said output terminals and the voltage signal provided by said reference means, and
a second component which is proportional to the first derivative of said error with respect to time whereby said feedback signal includes an element of anticipation so that more accurate tracking with the reference signal is facilitated.

4,178,630

FLUID-COOLED THYRISTOR VALVE

Karl E. Olsson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 30, 1978, Ser. No. 920,871
Claims priority, application Sweden, Jul. 12, 1977, 7708073
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—141 **10 Claims**



1. A fluid-cooled thyristor valve comprising:
an anode and a cathode connection;
a plurality of thyristors electrically connected in series;
a plurality of electrically conducting cooling bodies posi-

tioned at the anode and cathode sides of said thyristors to pass a cooling fluid to cool said thyristors;

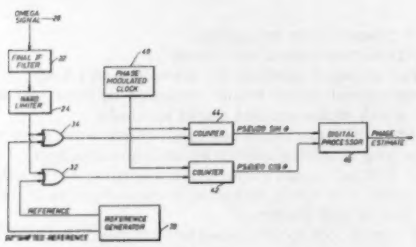
a plurality of electrically conducting fluid pipes cooperating with said electrically conducting cooling bodies to electrically connect the thyristors in series by connecting the cooling body on the anode side of each thyristor with the cooling body on the cathode side of an adjacent thyristor;

a plurality of electrically insulated fluid pipes for connecting the cooling body on the anode side of each thyristor with the cooling body on the cathode side of another adjacent thyristor.

4,178,631
DIGITAL PHASE DETECTOR AND METHOD

Robert L. Nelson, Jr., Austin, Tex., assignor to Tractor, Inc., Austin, Tex.

Filed Feb 13, 1978, Ser. No. 877,259
Int. Cl.[2] G06F *15/20*; H03D *13/00*
U.S. Cl. 364—484 **17 Claims**



1. A digital phase detector, comprising:

a hard limiter, operably connected to an incoming signal of known frequency to produce a signal square wave having said frequency;

a reference generator, said generator producing a reference square wave and a 90° phase shifted reference square wave, each having said known frequency;

a first logic element operably connected to produce a multiplicative output from the input of said signal square wave and said reference square wave;

a second logic element operably connected to produce a multiplicative output from the input of said signal square wave and said 90° phase shifted reference square wave;

a phase modulated clock;

a first counter operably connected to count said phase modulated clock under control of the output from said first logic element;

a second counter operably connected to count said phase modulated clock under control of the output from said second logic element; and

a digital processor, said processor operably connected to compute a phase estimate from the counts registered by said first and second counters.

4,178,632
METHOD FOR CONTROLLING THE OPERATION OF A COMPUTER OPERATED ROBOT ARM

Donald W. Anthony, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

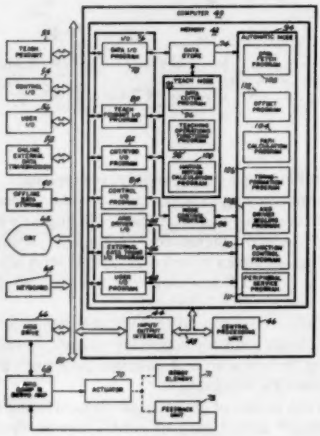
Filed Mar. 6, 1978, Ser. No. 883,472
Int. Cl.[2] G06F *15/46*; G05B *19/10*; B25J *9/00*
U.S. Cl. 364—513 **8 Claims**

1. A method for controlling a robot arm in response to sets of command signals stored in a memory, each set of command signals representing a programmed function and absolute coordinate values of a programmed position of the robot arm, said sets of command signals being divided into a first program represented by first sets of command signals and defining a basic cycle of operation of the robot arm and at least one second program represented by second sets of command signals and defining a conditional operation of the robot arm in response to a request signal, said sets of command signals being defined during a teaching mode of operation and being utilized during an automatic mode of operation, the method comprising the steps of:

(a) identifying during the teaching mode of operation one of the second programs as an offset program;

(b) recalling from the memory during the automatic mode of operation the first sets of command signals;

(c) moving the robot arm to the programmed positions defined by the absolute coordinate values of the first sets of command signals;



(d) detecting in response to the robot arm being moved to each programmed position a request for the offset program;

(e) determining offset values in response to the request for the offset program, each offset value representing the algebraic difference between one of the absolute coordinate values of the current programmed position of the robot arm and a corresponding absolute coordinate value of a programmed position in the offset program;

(f) producing new second sets of command signals by modifying the absolute coordinate values of each of the second sets of command signals in the offset program as a function of the offset values; and

(g) moving the robot arm to spatial positions defined by the new second sets of command signals.

4,178,633
PROGRAMMABLE CALCULATOR INCLUDING MULTIFUNCTION KEYS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,323
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—709 **2 Claims**

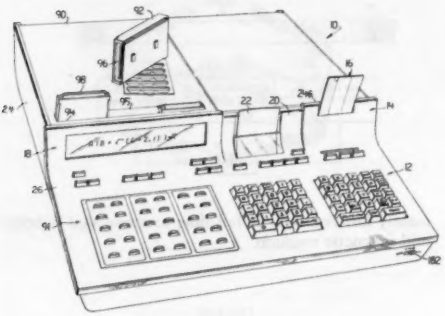
1. An electronic calculator comprising:

keyboard input means including a plurality of alphabetic, numeric, and function keys for entering alphameric information, including algebraic statements, into the calculator, at least one of said function keys representing a plurality

of different predetermined functions, each of said plurality of different predetermined functions being designated by a predetermined different number of successive actuations of said one or more of said function keys;

memory means, coupled to said keyboard input means, for storing alphameric information entered into the calculator from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for processing alphameric information entered into the calculator and stored in said memory means to perform selected functions and to compute the results of selected algebraic statements; and



output means, coupled to said processing means, for providing a visual indication of selected alphameric information;

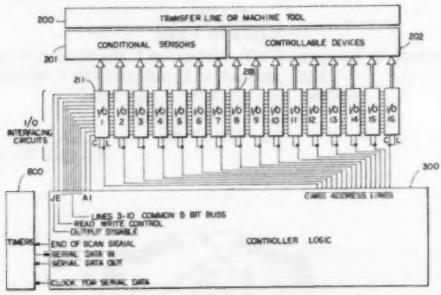
said processing means including logic means responsive to a particular number of successive actuations of one of said one or more of said function keys for causing entry of the one of said different predetermined functions associated therewith that has been designated by the particular number of successive actuations of that key, said processing means thereafter being operative for performing the entered function designated by the particular number of successive actuations of that key without at the same time performing any of the other predetermined functions represented by that key.

4,178,634

PROGRAMMABLE LOGIC CONTROLLER

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems Inc., Eldridge, Iowa

Filed Jul. 11, 1977, Ser. No. 814,836
Int. Cl.[2] G06F *3/04, 9/06*
U.S. Cl. 364—900 **19 Claims**



1. A programmable logic controller comprising:

(a) one bit output circuits having predetermined addresses;

(b) one bit input circuits having predetermined addresses;

(c) a one bit accumulator;

(d) means for generating a succession of program statements in the form of multiple-bit binary logic; and

(e) means for processing said program statements in succession to cause said output circuits to change state in response to the states of said accumulator, said output circuits and said input circuits and in response to said program statements, said processing means being operable upon a single statement at any given time and including

(1) a random access memory having several locations, each of said locations being for storage of a bit of binary logic, and each of said locations having a selected address different from said addresses of said input or output circuits,

(2) said processing means including means for addressing said locations in response to said program statements,

(3) said random access memory being divided into both a retentive portion and a non-retentive portion, each including several locations, each location being for storage of a bit of binary logic,

(4) means for automatically resetting, upon resumption of power to the controller after interruption, the memory in at least those locations in the non-retentive portions of the memory which were addressed in response to said program statements prior to said power interruption, and

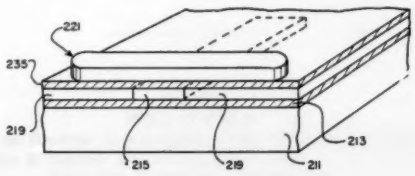
(5) memory holding means including a battery for supplying power to said retentive portion when power to the controller is interrupted, said power being sufficient to maintain the bit status of the memory in said retentive portion, said memory holding means thus preventing said means for automatically resetting from resetting locations in said retentive portion.

4,178,635

PLANAR AND NEAR PLANAR MAGNETIC BUBBLE CIRCUITS

Donald K. Rose, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 14, 1976, Ser. No. 695,609
Int. Cl.[2] G11C *11/14*
U.S. Cl. 365—19 **7 Claims**



1. A magnetic bubble circuit device comprising:

a substrate of a magnetic material capable of sustaining magnetic bubble domains in the presence of a bias magnetic field;

a nominally electrically conducting layer on the substrate having regions of an electrically conducting material contiguous with insulating regions of the anodic oxide of said conducting material, said insulating regions having been formed by selective anodization of said nominally electrically conducting layer so that said electrically conducting regions and said insulating regions have substantially co-planar top surfaces; and

a substantially planar pattern of elements of a magnetic material on said layer of electrically conducting and insulating regions.

4,178,636

GRADIENTLESS PROPULSION OF MAGNETIC BUBBLE DOMAINS

Bernell E. Argyle, Putnam Valley; John C. Slonczewski, Katonah, and Pieter Dekker, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 659,880, Feb. 20, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 877,928

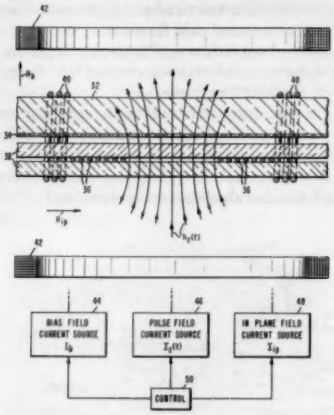
Int. Cl.[2] **G11C** *19/08*

U.S. Cl. 365—30 **39 Claims**

1. An apparatus for moving magnetic bubble domains having Bloch lines therein in a magnetic medium in the absence of active magnetic or conductor propagation elements, including:

means for applying a magnetic field in the plane of said medium,

means for applying a time varying magnetic field characterized by the absence of spatial gradients, said time varying magnetic field having a sufficient magnitude and sufficiently fast rise time or fall time to move said bubbles in said magnetic medium.



DESIGNS

DECEMBER 11, 1979

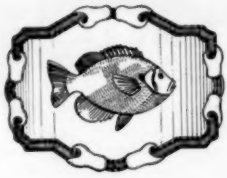
253,616
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,580
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

253,617
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,581
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

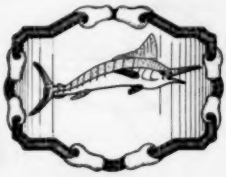
253,618
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,582
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

253,619
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,583
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

253,620
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,584
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

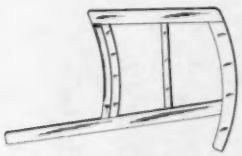


253,621
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,585
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

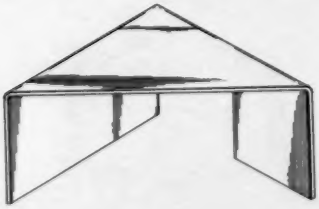


253,622
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,586
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

253,623
ROCKING CHAIR
France Berlic, 37-31 73rd St., Jackson Heights, N.Y. 11372
Filed Dec. 6, 1977, Ser. No. 857,923
Claims priority, application Yugoslavia, Jun. 6, 1977, 142/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



253,624
MODULAR TABLE OR THE LIKE
Dolores R. Browne, 2011 Spruce St., Philadelphia, Pa. 19103
Filed Aug. 8, 1977, Ser. No. 822,853
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—145

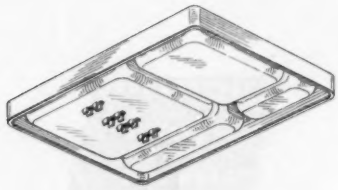


253,625
SPEAKER STAND
Larry K. Davis, 1701 S. Florence, Tulsa, Okla. 74104
Filed Oct. 28, 1977, Ser. No. 846,390
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184

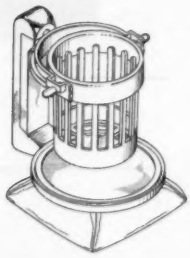
253,626
PLATTER
Richard N. Brandon, c/o Marco Tool & Die, 6868 Homestretch Rd., Dayton, Ohio 45414
Filed Jun. 6, 1977, Ser. No. 804,103
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—21

253,627
TRAY
Gerald J. Adamson, Toronto, Canada, assignor to Business Accessories Inc., Cambridge, Canada
Filed Aug. 1, 1977, Ser. No. 821,048
Claims priority, application Canada, May 3, 1977, 0305774
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37

253,628
TRAY
Gerald J. Adamson, Toronto, Canada, assignor to Business Accessories Inc., Cambridge, Canada
Filed Aug. 1, 1977, Ser. No. 821,049
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



253,629
CUP HOLDER
James O. Sage, 2112 Strand, Manhattan Beach, Calif. 90266
Filed Aug. 15, 1977, Ser. No. 824,990
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—70

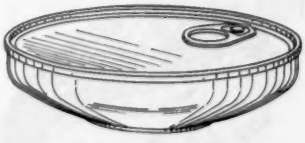


253,630
BOTTLE
Robert J. McCredie, Spring Lake Heights, N.J., assignor to J. L. Prescott Co., Passaic, N.J.
Filed Apr. 7, 1977, Ser. No. 785,768
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

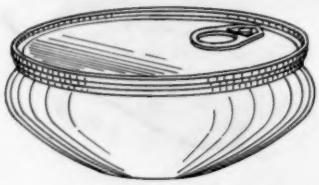
253,631
TOOTHPASTE TUBE OR THE LIKE
Dennis L. Cuddy, 1018 Nichols Dr., Raleigh, N.C. 27605
Filed Jun. 2, 1977, Ser. No. 802,775
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194

253,632
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,369
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

253,633
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,368
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

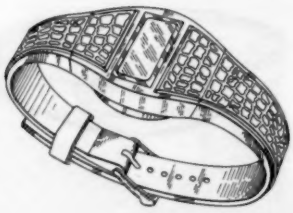


253,634
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,370
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

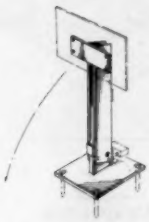


253,635
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,664
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

253,636
WRIST WATCH
Eugene J. Sulek, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 8, 1977, Ser. No. 822,492
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



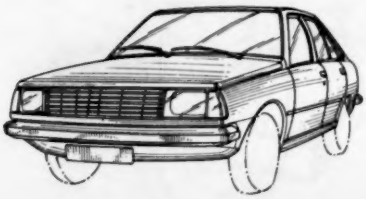
253,637
ARTICULATABLE PARKING SPACE BARRIER
Dennis L. Welbourne, 3019 W. Rancho Dr., Phoenix, Ariz. 85017
Filed Mar. 13, 1978, Ser. No. 885,694
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



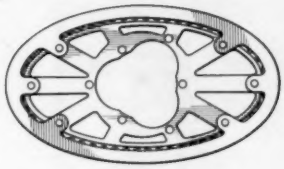
253,638
POOL EQUIPMENT CART
Keith L. Killingsworth, 73197 Adobe Springs, Palm Desert, Calif. 92660
Filed May 19, 1978, Ser. No. 907,781
Term of patent 3½ years
Int. Cl. D12—*02*
U.S. Cl. D12—34

253,639
CONVEYOR BELT
Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154
Filed Dec. 26, 1978, Ser. No. 973,392
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60

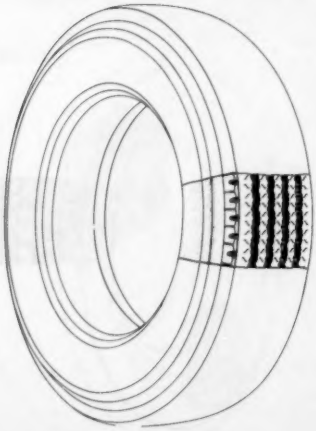
253,640
CAR BODY
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Billiancourt, France
Filed Dec. 13, 1977, Ser. No. 860,073
Claims priority, application France, Jun. 14, 1977, 75 754
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92



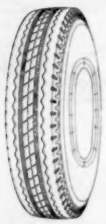
253,641
COMBINED BICYCLE SPROCKET AND DEFLECTOR PLATE
Curtis W. Tritchka, P. O. Box 6, Fallbrook, Calif. 92028
Filed Nov. 21, 1977, Ser. No. 853,199
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—123



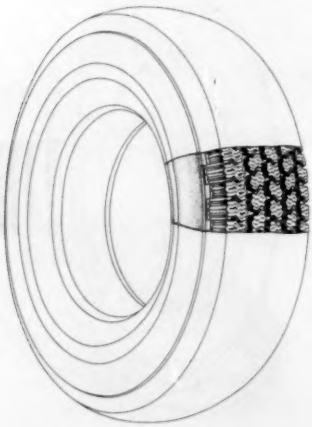
253,642
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jul. 28, 1978, Ser. No. 929,207
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



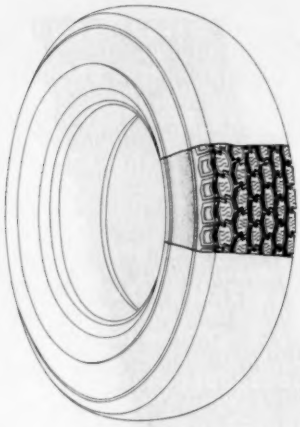
253,643
VEHICLE TIRE
Shigeo Makino, Tokorozawa; Hiroshi Kojima, Hino; Toshio Hayakawa, Higashi-Murayama, and Shigeo Watanabe, Kokubunji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jun. 27, 1977, Ser. No. 810,370
Claims priority, application Japan, Apr. 22, 1977, 52-14884
The portion of the term of this patent subsequent to Mar. 22, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



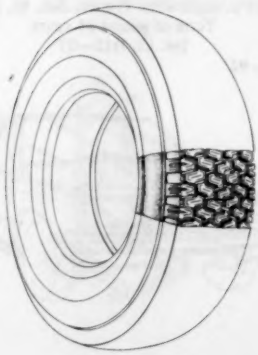
253,644
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 16, 1978, Ser. No. 916,301
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



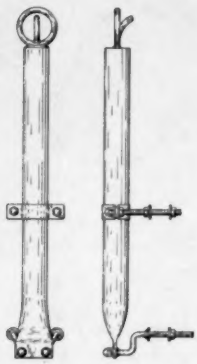
253,645
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 16, 1978, Ser. No. 916,303
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



253,646
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 7, 1978, Ser. No. 967,372
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151

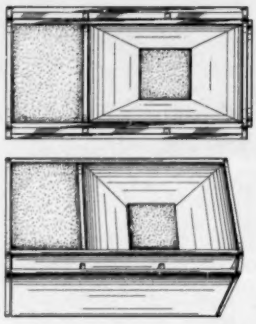


253,647
WATER SKI TOW HITCH
James F. Sell, R.R. #3, Box 157, Muncie, Ind. 47302
Filed May 18, 1977, Ser. No. 798,257
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—162



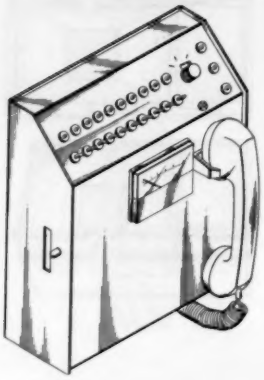
253,648
RECORD PLAYER
Kazuhito Ohtomo, c/o Sansui Electric Co., Ltd., No. 14-1, 2-chome, Izumi, Suginami-ku, Tokyo, Japan
Filed Jun. 6, 1977, Ser. No. 803,920
Claims priority, application Japan, Dec. 6, 1976, 51-47507
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17

253,649
LOUDSPEAKER
Robert S. Peveto, Dallas, Tex., assignor to Beta Sound, Incorporated, Dallas, Tex.
Filed Nov. 11, 1977, Ser. No. 850,653
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—33

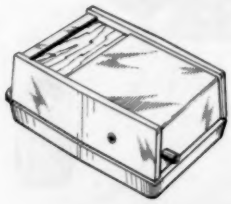


253,650
LOUDSPEAKER ENCLOSURE
Richard P. Shahinian, 1004 Old Medford Ave., Farmingville, N.Y. 11738
Filed Sep. 15, 1977, Ser. No. 833,573
Term of patent 14 years
Int. Cl. D14—*03;* D30—*02*
U.S. Cl. D14—34

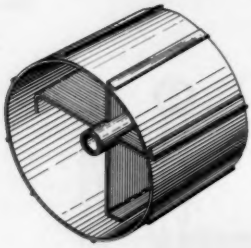
253,651
WALL MOUNTED CABINET FOR A PUBLIC ADDRESS SYSTEM
Paul E. Richards, P.O. Box 11536, San Diego, Calif. 92111
Filed Oct. 11, 1977, Ser. No. 841,329
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52



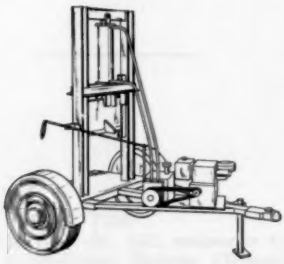
253,652
AIR PUMP OR SIMILAR ARTICLE
Peter A. Maryanski, Middletown, N.J., assignor to Metaframe Corporation, Elmwood Park, N.J.
Filed Feb. 17, 1978, Ser. No. 878,932
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—8



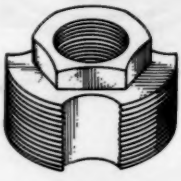
253,653
ROTOR FOR FOOD GRINDER
Ralph E. Reiner, 6474 Chestnut La., Orchard Park, N.Y. 14127
Filed Nov. 4, 1977, Ser. No. 848,453
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*
U.S. Cl. D15—98



253,654
TRAILER-MOUNTED LOG SPLITTER
Troy S. Davis, 800 Ross Trail, Arlington, Tex. 76012
Filed Sep. 19, 1978, Ser. No. 943,860
Term of patent 14 years
Int. Cl. D15—*09;* D12—*10*
U.S. Cl. D15—127



253,655
COLLET STOP
Philip H. Novodvorsky, 3700 Harding St., Long Beach, Calif. 90805
Filed May 22, 1978, Ser. No. 908,012
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—138



253,656

PAIR OF SPECTACLES

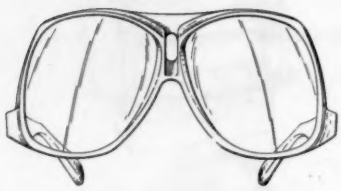
Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 3, 1978, Ser. No. 866,326

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—65



253,657

PAIR OF SPECTACLES

Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 3, 1978, Ser. No. 866,328

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—65

253,658

PRINTER/KEYBOARD FOR AN ELECTRONIC TYPING SYSTEM OR SIMILAR ARTICLE

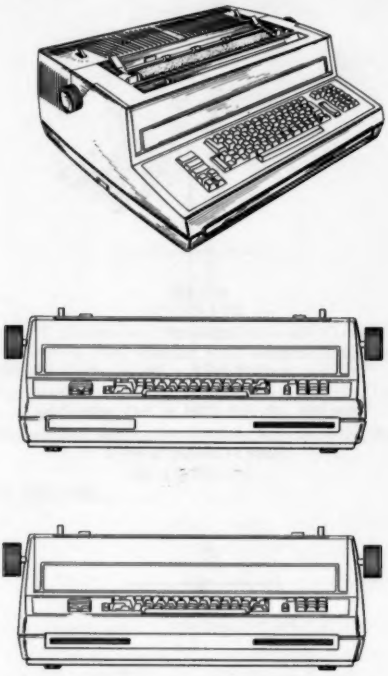
Gregory F. Fossella, Boston, Mass.; Dan W. Matthias, Honey Brook, Pa., and Michael J. Mercadante, North Quincy, Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,726

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—1



253,659

COMBINED RECORD JACKET AND DETACHABLE ERECTABLE PYRAMID

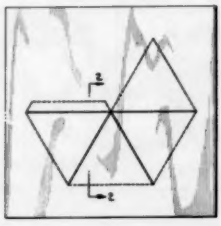
James F. Weeks, P. O. Box 7245, Macon, Ga. 31202

Filed Dec. 23, 1976, Ser. No. 753,812

Term of patent 14 years

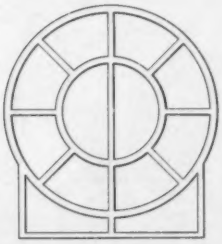
Int. Cl. D19—*04*

U.S. Cl. D19—26

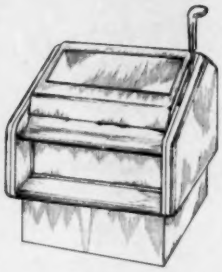


253,660
BALL-POINT PEN
Alain Carré, Paris, France, assignor to Waterman S.A.
Filed Apr. 7, 1977, Ser. No. 785,760
Claims priority, application France, Oct. 14, 1976, 75.144
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

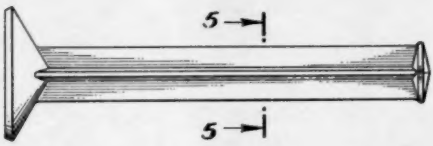
253,661
GAME PLAYING FIELD FRAME
LaMar Hopkins, R.D. 1, Norristown, Pa. 19401
Filed Sep. 26, 1977, Ser. No. 836,539
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—2



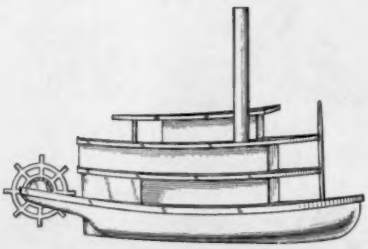
253,662
COIN-OPERATED GAMING MACHINE
Edward J. Stulik, Jr., Calabasas, Calif., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Jul. 19, 1977, Ser. No. 817,119
Claims priority, application United Kingdom, Apr. 13, 1977, 979664
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—38



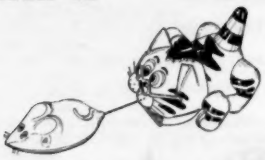
253,663
DART
Bernard J. Cagan, Los Angeles, and Kenneth L. McQuary, Hermosa Beach, both of Calif., assignors to Placo Products Company
Filed Apr. 10, 1978, Ser. No. 895,145
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—49



253,664
TOY RIVER BOAT
Charles E. Hughes, 172 W. Eugenie St., Chicago, Ill. 60614
Filed Feb. 28, 1977, Ser. No. 772,973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130

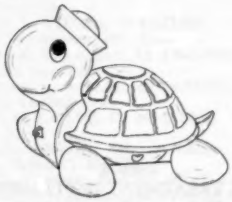


253,665
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Jul. 29, 1977, Ser. No. 820,394
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149



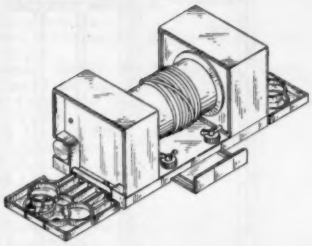
253,666
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Aug. 1, 1977, Ser. No. 820,789
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149

253,667
TOY TURTLE
Walter P. Doe, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,845
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157



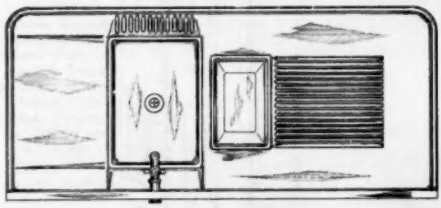
253,668
TOY OCTOPUS
Akira Takasaka, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jun. 21, 1978, Ser. No. 917,682
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157

253,669
PHYSICAL EXERCISER
Thomas Turk, Pokfulam, Hong Kong, assignor to Portagym International Limited, Hong Kong, Hong Kong
Filed May 9, 1978, Ser. No. 904,148
Claims priority, application United Kingdom, Nov. 23, 1977, 982394
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195

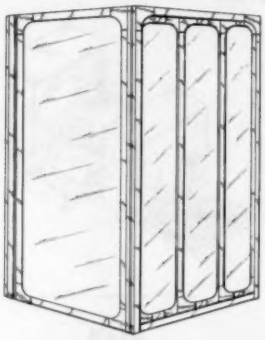


253,670
ICE SKATE
Holger B. I. Gustavsson, Nymilsgatan 5, 421 37 Västra Frölunda, Sweden; Adolf Hensler, and Ferdinand Haizinger, both of Michael Gruberstr. 10, A 8580 Köflach, Austria
Continuation of Ser. No. 684,896, May 10, 1976. This application Oct. 3, 1977, Ser. No. 839,288
Claims priority, application Sweden, Nov. 10, 1975, 2228
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—225

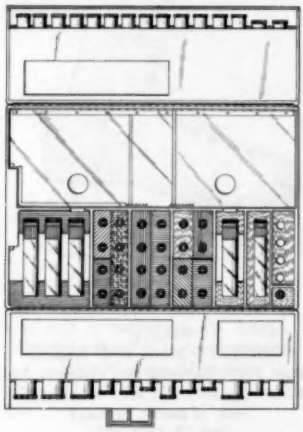
253,671
COMBINED SINK AND TABLE
Albert L. Kinsey, 18010 Burbank Dr., Potomac, Md. 20854
Filed Apr. 10, 1978, Ser. No. 895,187
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—61

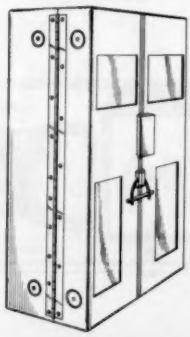


253,672
WALL UNIT FOR A CORNER SHOWER
Heinz G. Baus, Ulmenweg 46, Thun (Bern), Switzerland
Filed Sep. 1, 1977, Ser. No. 829,828
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 193
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



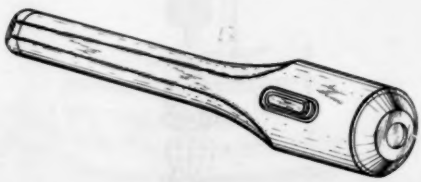
253,673
CARDIOPULMONARY RESUSCITATION KIT
Robert T. McKenzie, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Aug. 7, 1978, Ser. No. 931,836
Term of patent years
Int. Cl. D24—*01;* D6—*01*
U.S. Cl. D24—1.1





253,674
THIN ABSORBENT PAD FOR A PANTY LINER OR THE LIKE
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 13, 1978, Ser. No. 877,405
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51

253,675
NAIL TREATMENT IMPLEMENT
William J. Rakocy, Nutley, and Ronald L. Muller, New Milford, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,686
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—58



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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B C Concrete Products: *See*—
Hyytinen, Niilo M., 4,178,340, Cl. 264-73.000.

A-Betong AB: *See*—
Bondpers, Per-Erik; and Liljegren, Gote, 4,178,338, Cl. 264-42.000.

A. Monforts: *See*—
van der Horst, Eberhard, 4,177,700, Cl. 82-2.00R.

Ab Volvo Penta: *See*—
Pichl, Heinz, 4,177,747, Cl. 115-41.0HT.

Abbo, Edward. Modular telephone connecting box. 4,178,062, Cl. 339-154.00A.

Abbott Laboratories: *See*—
Dunnigan, Daniel A., 4,178,299, Cl. 260-409.000.
Terk, Harold S., 4,178,345, Cl. 422-61.000.

Abe, Keiji: *See*—
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.

Abe, Sigeya: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Abex Corporation: *See*—
Frank, Earl E.; and Yee, Bing S., 4,177,837, Cl. 138-31.000.

Abrahamson, Daniel P. Method and apparatus for cubing brick. 4,178,122, Cl. 414-110.000.

Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; by Boguslavskaya, Khaya S., administrator; by Komar, Olga E., administrator; and by Komar, Alexandr E., administrator. Method for producing mineral binder. 4,178,219, Cl. 204-157.10H.

Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Method and apparatus to permit substantial cancellation of interference between a received first and second signal. 4,178,550, Cl. 325-41.000.

ACF Industries, Incorporated: *See*—
Klimazewski, Leo T., 4,177,642, Cl. 60-290.000.
Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., 4,177,998, Cl. 277-59.000.
Morrison, Bertram L., 4,177,833, Cl. 137-625.120.

Achelpohl, Fritz, to Windmoller & Holscher. Lifting gear for filled sacks. 4,178,031, Cl. 294-82.00R.

Acoolco Corporation: *See*—
Ohling, Robert S., 4,177,648, Cl. 62-73.000.

Acoustic Fiber Sound Systems, Inc.: *See*—
Vermeren, Joseph P., 4,178,473, Cl. 179-1.0VE.

Acro-Fab Industries, Inc.: *See*—
Seakan, Raymond N., 4,177,541, Cl. 24-73.00A.

Acrow (Engineers) Limited: *See*—
Chapman, David, 4,177,968, Cl. 249-211.000.

Adachi, Miyako: *See*—
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.

Adams, Charles D.; Cummins, Earl W.; and Gleich, Steven I., to Du Pont de Nemours, E. I., and Company. Process for preparing herbicidal triazines. 4,178,448, Cl. 544-194.000.

Adams, Kenneth D.; and Brauch, Robert B., to Singer Company, The. Needle bar guide for a sewing machine. 4,177,745, Cl. 112-221.000.

Adams, Michael E. Mounting for two pairs of cymbals. 4,177,709, Cl. 84-422.00R.

Adams, Michael J.: *See*—
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Adams, Ralph D.; and Wyckoff, James K., to Cubic Western Data. Money box and vault. 4,177,889, Cl. 194-1.00B.

Agari, Yujiro: *See*—
Tsuji, Sadahiko; and Agari, Yujiro, 4,178,076, Cl. 350-184.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.

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Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.

Ahmed, Nazeer; and Fuchs, Francis J., Jr., to Western Electric Co., Inc. Methods and apparatus for continuous extrusion. 4,177,658, Cl. 72-60.000.

Ahroni, Joseph M. Fused electrical plug. 4,178,061, Cl. 339-147.00P.

Aiga, Makoto: *See*—
Hirai, Yutaka; Miyata, Katsuharu; Aiga, Makoto; and Hasegawa, Seiji, 4,178,455, Cl. 560-24.000.

Airwick Industries, Inc.: *See*—
Streit, Allan L.; and Sansanelli, Edward, 4,178,264, Cl. 252-316.000.

Aizawa, Hiroshi: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.

Ajax Hardware Corporation: *See*—
Gorton, Howard B., 4,177,540, Cl. 16-142.000.

Akerlund, Nils G. Spherically shaped triangular mirror device. 4,178,065, Cl. 350-295.000.

Aktiebolaget Bofors: *See*—
Skagerlund, Lars-Erik, 4,178,505, Cl. 250-203.00R.

Aktieselskabet Grindstedvaerket: *See*—
Gregersen, Jens A. H., 4,178,393, Cl. 426-653.000.

Aktieselskabet Nordiske Kabel-Traadfabriker: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.

Akzona Incorporated: *See*—
Zengel, Hans; and Bergfeld, Manfred, 4,178,315, Cl. 260-647.000.

Albrecht, Henry R.: *See*—
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.

Albright, James A., to Velsicol Chemical Corporation. Haloaryl halobenzenesulfonate flame retardants. 4,178,330, Cl. 525-3.000.

Albright, Jay D.: *See*—
Dusza, John P.; and Albright, Jay D., 4,178,449, Cl. 544-281.000.

Aldridge, Clyde L.: *See*—
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,178,227, Cl. 208-50.000.

Aldridge, David C.; Bowling, Roger; and Swait, John C., to Imperial Chemical Industries Limited. Fermentation process for the production of (+)-2-(5β-n-butyl-4β-hydroxy-2-oxo-tetrahydrofuran-3β-yl)-2α-methylacetic acid. 4,178,213, Cl. 195-81.000.

Alfio, Deregibus, to Goodyear Tire & Rubber Company, The. Apparatus for dusting an elastomeric surface. 4,177,755, Cl. 118-118.000.

Alig, Roger C., to RCA Corporation. CRT with field-emission cathode. 4,178,531, Cl. 313-409.000.

Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, to United States of America, Navy. Immersed reticle. 4,178,404, Cl. 428-209.000.

Allen, George W.; and Felton, Bruce C., to International Business Machines Corporation. D. C. Powered A. C. supply for reactive loads. 4,178,629, Cl. 363-96.000.

Allen, Gerald L.; and Chapman, Craig A. Incense burner device. 4,178,346, Cl. 422-126.000.

Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. Etherified triazolobenzodiazepine derivatives. 4,178,378, Cl. 424-269.000.

Allibert Exploitation: *See*—
Deconinck, Didier, 4,177,901, Cl. 211-105.100.

Allis-Chalmers Corporation: *See*—
Farkas, Kalman; and Krebs, Gary A., 4,177,610, Cl. 51-241.00S.
Raber, Harry M., 4,177,999, Cl. 277-112.000.

Altarctic Engineering & Construction Ltd.: *See*—
Weed, Gehres D., 4,178,126, Cl. 416-17.000.

Aluminum Company of America: *See*—
Hawkins, Ronald G., 4,178,467, Cl. 174-40.00R.

Aluminum Plumbing Fixture Corp.: *See*—
Uhlig, Richard E., 4,177,527, Cl. 4-3.000.

Alvarez Domingo, Mercedes: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

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Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, to Rieter Machine Works, Ltd. Apparatus for dividing a flock-laden air stream in pneumatic transporting systems for spinning machines. 4,178,114, Cl. 406-155.000.

Amazawa, Kiyoshi; and Mori, Masaharu, to Clarion Co., Ltd. Noise eliminating circuit. 4,178,552, Cl. 325-479.000.

Amchem Products, Inc.: *See*—
Lochel, Frank P., Jr., 4,178,400, Cl. 427-435.000.

American Can Company: *See*—
Meyers, George L., 4,177,715, Cl. 93-37.00R.

American Cyanamid Co.: *See*—
Berkelhammer, Gerald; and Kameswaran, Venkataraman, 4,178,460, Cl. 562-426.000.
Dusza, John P.; and Albright, Jay D., 4,178,449, Cl. 544-281.000.

Fetchin, John A.; and Tsu, Kin H., 4,178,310, Cl. 260-561.00N.
Schaub, Robert E.; and Weiss, Martin J., 4,178,461, Cl. 562-463.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., 4,178,456, Cl. 560-53.000.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,178,284, Cl. 260-112.50R.

American Hospital Supply Corporation: *See—*
Grow, Harry N.; and Zboralski, Jon A., 4,177,717, Cl. 98-115.0LH.
Grow, Harry N.; and Zboralski, Jon A., 4,177,718, Cl. 98-115.0LH.

American Minechem Corporation: *See—*
Messer, Leonard, 4,178,243, Cl. 210-54.000.

American Optical Corporation: *See—*
Metcalfe, Richard T., 4,178,081, Cl. 351-153.000.

American Sunroof Corporation: *See—*
Kalitz, Milton C., 4,178,036, Cl. 296-137.00B.

AMP Incorporated: *See—*
Fleischhacker, James E.; and Wasserlein, Henry G., Jr., 4,178,055, Cl. 339-98.000.
Hoover, Charles D., 4,178,068, Cl. 350-96.210.
Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., 4,178,067, Cl. 350-96.210.
Kocher, Timothy L.; and Bennett, Benny M., 4,178,051, Cl. 339-45.00M.
Laudig, Ronald C., 4,178,054, Cl. 339-95.00R.

AMSTED Industries Incorporated: *See—*
Stanley, John M.; and Greene, Bernard A., 4,178,001, Cl. 277-152.000.

Amsterdam Brush Company: *See—*
Edelson, Stanley; and Feinberg, Samuel, 4,177,903, Cl. 211-49.00D.

Anaconda Company, The: *See—*
Arentzen, Charles, 4,178,174, Cl. 75-74.000.

Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., to Aktieselskabet Nordiske Kabel-Traadfabriker. Process for preparing an optical element for incorporation into optical transmission means. 4,178,069, Cl. 350-96.230.

Anderson, Charles E., to Cherne Industries, Inc. Internal pipe cutter. 4,177,559, Cl. 30-105.000.

Anderson Company of Indiana, The: *See—*
Roadarmel, Gary W., 4,177,537, Cl. 15-250.320.

Anderson, Donald F.; and Yu, Arthur J., to Stauffer Chemical Company. Internally stabilized vinyl chloride polymers comprising calcium and zinc acrylates. 4,178,423, Cl. 526-240.000.

Anderson, James M.: *See—*
Anderson, Samuel J.; and Anderson, James M., 4,177,853, Cl. 160-168.00R.

Anderson, John W., to H. H. Robertson Company. Fastening device for roof panel joints. 4,177,615, Cl. 52-478.000.

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Anderson, Robert L., to Ford Motor Company. Compensation of sensor voltage for reference potential variation. 4,177,770, Cl. 123-32.0EE.

Anderson, Samuel J.; and Anderson, James M., to International Blind Company. Venetian blind assembly and mounting means therefor. 4,177,853, Cl. 160-168.00R.

Ando, Kunio: *See—*
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.

Ando, Shimon: *See—*
Iwamoto, Taro; and Ando, Shimon, 4,177,913, Cl. 228-9.000.

Ando, Yujiro: *See—*
Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, 4,177,757, Cl. 118-658.000.

Andres, Rudolf; and Knoll, Heinz W., to Daimler-Benz Aktiengesellschaft. Triggering installation for a passenger protection device in a vehicle. 4,178,016, Cl. 280-734.000.

Andrew Corporation: *See—*
Schmidt, Daniel R., Jr.; and Busse, Joseph F., 4,178,576, Cl. 343-781.00R.

Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Active acoustic sound absorber device. 4,177,874, Cl. 181-206.000.

Angelov, Angel S.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Angermann, Manfred E. Display casket. 4,177,543, Cl. 27-35.000.

Angst, Arthur, to Reishauer AG. System for the production of an additional rotational motion of a helically toothed gear workpiece in a positively controlled gear processing machine. 4,178,537, Cl. 318-603.000.

Anic S.p.A.: *See—*
Fusco, Raffaello, 4,178,242, Cl. 210-54.000.

Ankenman, Thomas W.: *See—*
White, Allen A.; and Ankenman, Thomas W., 4,177,684, Cl. 74-212.000.

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Aoki, Shigeta: *See—*
Ogawa, Hiroshi; Aoki, Shigeta; and Arai, Tatsuo, 4,177,850, Cl. 152-209.00R.

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Beisch, Hans R.; Apczynski, Frederick A.; and Gillespie, James E., 4,178,043, Cl. 301-37.0SS.

Appalachian Electronic Instruments, Inc.: *See—*
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Application des Gaz: *See—*
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Arbogast, Robert E.: *See—*
Arbogast, Charles J.; and Arbogast, Robert E., 4,177,525, Cl. 3-7.000.

Arcanum Corporation: *See—*
Caswell, Bruce F., 4,178,341, Cl. 264-117.000.

Arentzen, Charles, to Anaconda Company, The. Direct production of copper metal. 4,178,174, Cl. 75-74.000.

Argyle, Bernell E.; Slonczewski, John C.; and Dekker, Pieter, to International Business Machines Corporation. Gradientless propulsion of magnetic bubble domains. 4,178,636, Cl. 365-30.000.

Arlt, Dieter: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.

Arnold, Fred E.; and Reinhardt, Bruce A., to United States of America, Air Force. Thermally stable enyne polysulfone polymers. 4,178,428, Cl. 528-174.000.

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Arp, George F., to Heldor Associates, Inc. Swimming pool wall of resin panels. 4,177,614, Cl. 52-247.000.

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Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., 4,177,813, Cl. 128-326.000.

Arrowsmith, David R., to Automotive Products Limited. Friction clutch plate with two concentric hubs for damping. 4,177,888, Cl. 192-106.200.

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Oda, Toyohisa; and Inouye, Kinichi, 4,178,417, Cl. 428-679.000.
Seko, Maomi, 4,178,218, Cl. 204-98.000.

Asanagi, Etsuo; and Idemura, Hideo, to Chiyoda Chemical Engineering & Construction Company, Ltd. Process for removing sulfur oxides in exhaust gases. 4,178,348, Cl. 423-242.000.

Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, to Canon Kabushiki Kaisha. Range detecting method and apparatus. 4,178,098, Cl. 356-1.000.

Asbell, Burma B. Magnifying cylinder for insulin syringe. 4,178,071, Cl. 350-116.000.

ASEA AB: *See—*
Garvare, Tore; and Isaksson, Sven-Erik, 4,178,178, Cl. 75-226.000.

ASEA Aktiebolag: *See—*
Olsson, Karl E., 4,178,630, Cl. 363-141.000.

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Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Ashling, Lloyd W. Heater adapter for improved automobile heater performance. 4,177,925, Cl. 237-12.30B.

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Rolf, Steven R.; DeVries, James L.; and Ashworth, T., 4,177,667, Cl. 73-1.00G.

Associated Electrical Industries Limited: *See—*
Blackman, Peter G., 4,177,682, Cl. 74-128.000.

Astrove, Edgar. Mirror assembly using mirror, clamps and standoff axles. 4,177,966, Cl. 248-467.000.

Ato Chimie: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.

Attwood, Brian E. Class D amplifier system. 4,178,556, Cl. 330-10.000.

Aubert, Rene, to Societe d'Usinage des Tubes pour l'Electricite S.U.T.E. Method of manufacturing cable clips and device for applying the method. 4,177,547, Cl. 29-432.000.

Auburn, Parker K. Survival belt. 4,177,522, Cl. 2-338.000.

Aucktor, Erich, to Lohr & Bromkamp G.m.b.H. Transmission shaft. 4,177,654, Cl. 64-21.000.

Audi Nsu Auto Union Aktiengesellschaft: *See—*
Leitermann, Wulf; and Lechler, Rolf, 4,177,786, Cl. 123-196.00R.

Austin Industries, Inc.: *See—*
Kent, Frank N., Jr., 4,178,005, Cl. 280-43.180.

Automation Equipment Inc.: *See—*
Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., 4,177,567, Cl. 33-23.00K.

Automation Systems Inc.: *See*—
Bartlett, Peter G., 4,178,634, Cl. 364-900.000.
Automotive Products Limited: *See*—
Arrowsmith, David R., 4,177,888, Cl. 192-106.200.
Avco Corporation: *See*—
Humphrey, Robert J., 4,177,898, Cl. 206-494.000.
Ivanko, Theodore; and Saboe, Michael S., 4,177,693, Cl. 74-661.000.
Axelrod, Zalman L.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Aydin, Kemal, to Kadex, Inc. Electronic lock system. 4,177,657, Cl. 70-278.000.
Ayers, John S.; and Husbands, David R., to Development Finance Corporation of New Zealand. Sulphated ion exchanger and method for preparation thereof. 4,178,439, Cl. 536-59.000.
Azuma, Shinsuke. Rotary brush. 4,177,532, Cl. 15-24.000.
Azzerri, Nazzareno; and Bruno, Roberto. Electrolytic pickling of silicon electrical steel sheet. 4,178,194, Cl. 148-111.000.
B. F. Goodrich Company, The: *See*—
Miller, Larry G., 4,177,955, Cl. 241-183.000.
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Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.
Babcock & Wilcox Co., The: *See*—
Wehrmeister, Allen E., 4,177,765, Cl. 122-4.00D.
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., to Wynn Oil Company. Engine coolant system flush attachment for coolant hose. 4,178,134, Cl. 417-181.000.
Bachschmid, Reiner: *See*—
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Back Bay Company, Inc.: *See*—
Phelps, Richard D., 4,177,739, Cl. 108-144.000.
Bae, Kook J., to Claremont Polychemical Corporation. Vinyl resin stabilizer. 4,178,282, Cl. 260-45.75W.
Baertsch, Richard D.: *See*—
Engeler, William E.; and Baertsch, Richard D., 4,178,519, Cl. 307-221.00D.
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., to TRW, Inc. Subscriber terminal for use in a TDM switching system. 4,178,478, Cl. 179-15.0AQ.
Baichtal, James R.: *See*—
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., 4,178,479, Cl. 179-15.0BY.
Bailey, Peter E. Bundle squaring machine. 4,178,118, Cl. 414-28.000.
Baker Engineering Enterprises Ltd.: *See*—
Friedenberg, Leonald W.; and Baker, James A., 4,177,674, Cl. 73-198.000.
Friedenberg, Leonald W.; and Baker, James A., 4,177,675, Cl. 73-198.000.
Baker, James A.: *See*—
Friedenberg, Leonald W.; and Baker, James A., 4,177,674, Cl. 73-198.000.
Friedenberg, Leonald W.; and Baker, James A., 4,177,675, Cl. 73-198.000.
Baker, Joseph W.; Cova, Dario R.; and White, James E., to Monsanto Company. Preparation and purification of phosphoryl chloride. 4,178,353, Cl. 423-300.000.
Balaguer, Rodolfo R. Cooking process and apparatus. 4,177,719, Cl. 99-358.000.
Ball Corporation: *See*—
Brugger, Richard D., 4,178,516, Cl. 250-566.000.
Ballas, George C., to Weed Eater, Inc. Rotary cutting assembly. 4,177,561, Cl. 30-276.000.
Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.: *See*—
de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., 4,177,585, Cl. 37-67.000.
Balz, Gunther W., to Roto-Finish Company, Inc. Finishing apparatus embodying improved seal and method. 4,177,608, Cl. 51-163.200.
Banks, Edwin L., Jr.: *See*—
Dowell, Terrence P.; and Banks, Edwin L., Jr., 4,177,882, Cl. 188-1.00B.
Barr, Kenneth W., to Robertshaw Controls Company. Two wire piezoelectric acceleration transmitter. 4,178,525, Cl. 310-319.000.
Barrett, Michael G.: *See*—
Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., 4,178,352, Cl. 423-329.000.
Barrett, Robert C. Side by side bicycle. 4,178,008, Cl. 280-231.000.
Barry Wright Corporation: *See*—
Dowell, Terrence P.; and Banks, Edwin L., Jr., 4,177,882, Cl. 188-1.00B.
Bartlett, Peter G., to Automation Systems Inc. Programmable logic controller. 4,178,634, Cl. 364-900.000.
BASF Aktiengesellschaft: *See*—
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, 4,178,217, Cl. 204-55.00Y.
Horn, Peter; Grosskinsky, Otto-Alfred; and Fuchs, Hugo, 4,178,317, Cl. 585-357.000.
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.
BASF Wyandotte Corporation: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,178,256, Cl. 252-8.750.
Compton, John W.; and Eisenstein, Stephen E., 4,178,262, Cl. 252-162.000.
Langdon, William K., 4,178,434, Cl. 528-405.000.
Bataille, Jean R. Fixing device for securing non-rigid shoes on skis. 4,178,013, Cl. 280-618.000.
Batts, John H.; and Garrison, Judd F., to John Thomas Batts, Inc. Locking parallel bar hanger. 4,177,908, Cl. 223-96.000.
Baumann, Erwin L., to Ford Aerospace & Communications Corp. Lamp assembly. 4,178,627, Cl. 362-240.000.
Baxter Travenol Laboratories, Inc.: *See*—
Winchell, David A.; and Fowles, Thomas A., 4,177,905, Cl. 215-246.000.
Bayer Aktiengesellschaft: *See*—
Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, 4,178,383, Cl. 424-304.000.
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Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.
Schossler, Willi; Behre, Horst; and Putter, Rolf, 4,178,308, Cl. 260-509.000.
Schwarz, Hans-Helmut, 4,177,645, Cl. 62-23.000.
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.
Bayerische Motoren Werke Aktiengesellschaft: *See*—
Muth, Hans-Albrecht; and v. d. Marwitz, Hans-Gunther, 4,178,033, Cl. 296-78.100.
Baylis, Shelby M.; and Szauer, Jorge S., to Baylis, Shelby M. Rotary biopsy device and method of using same. 4,177,797, Cl. 128-2.00B.
BBC Brown Boveri & Company, Limited: *See*—
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,72[illegible], Cl. 101-129.000.
Beach Manufacturing Corporation: *See*—
Sara, George M., 4,178,097, Cl. 355-100.000.
Bearden, Roby, Jr.: *See*—
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,178,227, Cl. 208-50.000.
Beatrice Foods Co.: *See*—
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Beaver Precision Products, Inc.: *See*—
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Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., to Macronetics, Inc. Buffer storage apparatus for semiconductor wafer processing. 4,178,113, Cl. 406-10.000.
Beck, Gunther: *See*—
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Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, to Hoechst Aktiengesellschaft. Plastics material having an improved blood tolerance. 4,178,329, Cl. 525-77.000.
Beckman Instruments, Inc.: *See*—
Nielsen, Steven T., 4,177,921, Cl. 233-20.00R.
Bedding, Robin A., to Commonwealth Scientific and Industrial Research Organization. Nematode larvae as biological insecticides. 4,178,366, Cl. 424-93.000.
Behre, Horst: *See*—
Schossler, Willi; Behre, Horst; and Putter, Rolf, 4,178,308, Cl. 260-509.000.
Behringwerke Aktiengesellschaft: *See*—
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Bein, Thomas W.: *See*—
Thelen, William G.; and Bein, Thomas W., 4,178,143, Cl. 418-19.000.
Beirne, Patrick R.: *See*—
Cowpland, Michael C. J.; and Beirne, Patrick R., 4,178,485, Cl. 179-18.0FA.
Beisch, Hans R.; Apczynski, Frederick A.; and Gillespie, James E., to Norris Industries, Inc. Simulated wire wheel trim for automotive wheels. 4,178,043, Cl. 301-37.0SS.
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Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.
Bell & Howell Company: *See*—
Orsinger, Winston A.; and Fallos, George, 4,177,979, Cl. 270-54.000.
Bell Telephone Laboratories, Incorporated: *See*—
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,178,550, Cl. 325-41.000.
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Carbrey, Robert L., 4,178,480, Cl. 179-15.0BM.
Henry, Paul S., 4,178,557, Cl. 330-10.000.

Joel, Amos E., Jr., 4,178,474, Cl. 179-1.50R.
Klein, Theodore H., 4,177,553, Cl. 29-625.000.

Bellocchi, Louis, Jr. Pet play house. 4,177,761, Cl. 119-19.000.

Belyaev, Vasily D.: *See—*
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Bendix Corporation, The: *See—*
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Benjamin, Benjamin C., to Schmelzer Corporation. Flexible time delay valve. 4,177,831, Cl. 137-513.500.

Bennett, Benny M.: *See—*
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Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, to Rhone-Poulenc Industries. Dithiinoacetic acid and its preparation. 4,178,290, Cl. 549-22.000.

Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., to Hoffmann-La Roche Inc. Carbazole acetic acid derivatives. 4,178,289, Cl. 260-315.000.

Berges, David A., to SmithKline Corporation. Sulfaminoalkyl substituted tetrazole thiol intermediates for preparing cephalosporins. 4,178,288, Cl. 548-251.000.

Bergfeld, Manfred: *See—*
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Bergkvist, Lars A. Device for cleaning windshields, headlamp lenses, rear view mirrors, reflector means or the like of a vehicle. 4,177,928, Cl. 239-129.000.

Bergwerksverband GmbH: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.

Berkelhammer, Gerald; and Kameswaran, Venkataraman, to American Cyanamid Co. 2-Haloalkyl(oxy-, thio-, sulfinyl-, or sulfonyl)-phenylalkanoic acids. 4,178,460, Cl. 562-426.000.

Berkowitz, Ami E.; and Lahut, Joseph A., to General Electric Company. Magnetic belt with conductive coating. 4,178,405, Cl. 428-215.000.

Bernady, Karel F.: *See—*
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Berry, Daniel D.; and Girardi, Richard V., to Union Carbide Corporation. Tire band ply lubricant powder. 4,178,257, Cl. 252-21.000.

Bethlehem Steel Corporation: *See—*
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Beutel, Robert C., to Magnavox Company, The. Comb filter having improved luminance response. 4,178,609, Cl. 358-31.000.

Bevilacqua, Albert J., to C. R. Bard, Inc. Dual terminal transcutaneous electrode. 4,177,817, Cl. 128-802.000.

Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., to McCain Manufacturing Corporation. Sheet feeders. 4,177,982, Cl. 271-5.000.

Beyl, Jean J. A. Ski boot and binding assembly. 4,177,584, Cl. 36-117.000.

BF Goodrich Company, The: *See—*
Tenney, Linwood P.; and Lane, Parley C., Jr., 4,178,424, Cl. 526-283.000.

Bharteey, Brij M.: *See—*
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Bianco, Donald R.: *See—*
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Bifok AB: *See—*
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Big-Inch Marine Systems, Inc.: *See—*
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Biloma GmbH Spezialmaschinenfabrik: *See—*
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Bilow, Norman, to Hughes Aircraft Company. Polymeric Schiff's bases containing acetylene terminal groups. 4,178,430, Cl. 528-245.000.

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Bio-Dynamics Inc.: *See—*
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Bischkopf, Gerd; Gawarecki, Herbert; and Cremer, Gerhard, to Biloma GmbH Spezialmaschinenfabrik. Method of and apparatus for making tampons. 4,177,544, Cl. 28-119.000.

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Bittle, Ronald G.: *See—*
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Bjorklund, Gary C.; Bloom, David M.; and Liao, Paul F., to Bell Telephone Laboratories, Incorporated. Sub-picosecond optical gating by degenerate four-wave mixing. 4,178,079, Cl. 350-353.000.

Black & Decker Inc.: *See—*
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Blackman, Peter G., to Blackman, Peter George; and Associated Electrical Industries Limited. Mechanism and a method for the support and stepwise rotation of a member. 4,177,682, Cl. 74-128.000.

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Blackman, Peter G., 4,177,682, Cl. 74-128.000.

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Blaiklock, William M.; and Fisher, Brian A., to Tridon Limited. Windshield wiper element. 4,177,538, Cl. 15-250.390.

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Blaszkowski, Henry. Soap bar and holder. 4,177,965, Cl. 248-359.000.

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Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., to Polaroid Corporation. Sulfam(na)phthaleins. 4,178,446, Cl. 544-33.000.

Bly, Vincent T., to United States of America, Army. System for generating a dynamic far infrared image. 4,178,514, Cl. 250-493.000.

Bobo, Roy A. Rotating cyclone centrifuge apparatus. 4,178,234, Cl. 209-211.000.

Boenecke, Charles A. Tamperproof handset for railroad applications. 4,178,490, Cl. 179-178.000.

Boguslavskaya, Khaya S., administrator: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Bondpers, Per-Erik; and Liljegren, Gote, to A-Betong AB. Method of casting thin-walled, hollow concrete posts. 4,178,338, Cl. 264-42.000.

Bonney, Roland W. Rotary four way tandem center valve. 4,177,834, Cl. 137-625.230.

Booth, Charles R. Scalar irradiance meter. 4,178,101, Cl. 356-221.000.

Bopp, Robert D.: *See—*
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Borcherding, Norbert R. Farrowing crate. 4,177,762, Cl. 119-20.000.

Borg-Warner Corporation: *See—*
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Borgardt, Manfred: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., to Polaroid Corporation. Novel synthesis of 3,3-substituted dihydrobenzisothiazole-1,1-dioxides and -2,3-dihydronaphtho-1,2-thiazine-1,1-dioxides. 4,178,447, Cl. 544-33.000.

Borror, Alan L.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,178,446, Cl. 544-33.000.

Bosch Cartes, Juan: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

Boston, James D., III. Variable angle aperture card. 4,177,573, Cl. 33-277.000.

Bottalico, Frank P.; and Bottalico, Frank P., Jr. Micro-wave air heater. 4,178,494, Cl. 219-10.55R.

Bottalico, Frank P., Jr.: *See—*
Bottalico, Frank P.; and Bottalico, Frank P., Jr., 4,178,494, Cl. 219-10.55R.

Boucher, Gary R. Electronic music synthesizer. 4,177,707, Cl. 84-1.010.

Bourdeau, Romeo G.: *See—*
Metcalfe, Robert A.; and Bourdeau, Romeo G., 4,178,335, Cl. 264-8.000.

Bourgeois, Ronald D. Wetting station, rotating conveyor station, self cleaning conveyor unit, and conveyor system using same. 4,177,753, Cl. 118-16.000.

Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., to Delalande S. A. Novel cinnamoyles piperazines and homopiperazines, the method of preparing them and their application in therapeutics. 4,178,442, Cl. 542-440.000.

Bourns, Inc.: *See—*
Munson, Ramon J., 4,177,830, Cl. 137-501.000.

Bout, Daniel, to Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N.S.E.R.M.; and Institut

Pasteur. Method of preparing an antiparasitic immunological agent, the product obtained, and its application. 4,178,365, Cl. 424-88.000.

Boutin, Jean; and Neel, Jean, to Rhone-Poulenc Industries. Process for the preparation of water-soluble acrylic polymers by photopolymerization. 4,178,221, Cl. 204-159.230.

Bowe, Gerald J.; and Skuba, Thadeus, to Bowe, Gerald J. Automatic energy saver and fire damper for exhaust systems. 4,177,716, Cl. 98-115.0SB.

Bowen, Galt S.: *See*—
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., 4,177,868, Cl. 177-211.000.

Bowen, John G., to Rincon Industries, Inc. Heating unit indicator for disinfecting soft lenses, or the like. 4,178,499, Cl. 219-439.000.

Bowes, Quentin: *See*—
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.

Bowling, Roger: *See*—
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.

Bowthorpe-Hellermann Limited: *See*—
McCormick, Mathew, 4,178,057, Cl. 339-103.00M.

Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, to Ato Chimie. Process for preparing sulphonic acids and sulphonates. 4,178,307, Cl. 260-504.00S.

Brakebill, Harold G.; and Dexter, Edwin M., to Robertshaw Controls Company. Condition responsive valve construction and method of making the same. 4,177,924, Cl. 236-86.000.

Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, to Bayer Aktiengesellschaft. Fungicidally active oxime-ethers of isonitrosocyanoacetamides. 4,178,383, Cl. 424-304.000.

Brandt, Harold H. Hillside attachment for combines. 4,177,628, Cl. 56-209.000.

Branson Ultrasonics Corporation: *See*—
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,178,188, Cl. 134-1.000.

Brauch, Robert B.: *See*—
Adams, Kenneth D.; and Brauch, Robert B., 4,177,745, Cl. 112-221.000.

Braud, Societe Anonyme: *See*—
Delfosse, Gilbert, 4,177,891, Cl. 198-570.000.

Bray, Geddes A., to Mather & Platt Limited. Sprinkler arrangements. 4,177,862, Cl. 169-17.000.

Breda Termomeccanica S.p.A.: *See*—
Panzeri, Cesare, 4,177,644, Cl. 60-721.000.

Bresler, Boris M.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Brickman, Harold. Foldable convertible stool-table-bar. 4,177,737, Cl. 108-11.000.

Bridgestone Tire Company Limited: *See*—
Ogawa, Hiroshi; Aoki, Shigeta; and Arai, Tatsuo, 4,177,850, Cl. 152-209.00R.

Brihier, Gerard C. C., to Facom. Apparatus for testing the operation of a device controlling the ignition of an internal combustion engine. 4,178,541, Cl. 324-385.000.

Brina, Guido J. Container with mixing cartridge. 4,177,938, Cl. 222-80.000.

Brindopke, Dieter, to Robert Krups. Electrically heatable household appliance. 4,178,500, Cl. 219-524.000.

Bristol-Myers Company: *See*—
Thomas, Ralph H., 4,177,939, Cl. 222-153.000.

Broccali, Giampietro: *See*—
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.

Brod, Heinrich: *See*—
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.

Brodt, Rudolf: *See*—
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

Brooks, Alfred W., to Cannon Limited. Organic material treatment process. 4,177,575, Cl. 34-13.000.

Brotherston, Colin P., to Lucas Industries Limited. Pressure regulator for a fluid pump. 4,178,137, Cl. 417-294.000.

Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., to Texaco Inc. High vertical conformance steam drive oil recovery method. 4,177,752, Cl. 166-263.000.

Brown, Robert C.; and Mickschl, Lyle H., to Minnesota Mining and Manufacturing Company. Tape structure and garment closure made therewith. 4,177,812, Cl. 128-284.000.

Brown, Thomas G., to Reed Manufacturing Company. Internal cutter for trimming plastic pipe. 4,177,558, Cl. 30-103.000.

Brown, Thomas W.: *See*—
Cook, Brian A.; and Brown, Thomas W., 4,178,260, Cl. 252-49.800.

Brown, William F., to Wausau Homes, Inc. Fireproof barrier coating compositions. 4,178,273, Cl. 260-29.4UA.

Brown & Williamson Tobacco Corporation: *See*—
Psaras, John D., 4,177,576, Cl. 34-33.000.

Brubaker, James E., to United States of America, Energy. Self locking drive system for rotating plug of a nuclear reactor. 4,178,208, Cl. 176-30.000.

Bruesselbach, Hans W.: *See*—
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.

Brugger, Richard D., to Ball Corporation. Mold reader. 4,178,516, Cl. 250-566.000.

Brugler, Richard K., to Heltzel Company. Mobile side-by-side batching plant. 4,178,117, Cl. 414-21.000.

Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, to Varian Mat GmbH. Ionization of organic substances on conveyor means in mass spectrometer. 4,178,507, Cl. 250-282.000.

Bruno, Roberto: *See*—
Azzerri, Nazzareno; and Bruno, Roberto, 4,178,194, Cl. 148-111.000.

Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., to Liggett Group Inc. Tobacco composition. 4,177,822, Cl. 131-17.00R.

Bubar, Stanley F.; and Jennings, David L., to General Electric Company. Aluminum base for electric lamps having a plastic coating for improved corrosion resistance. 4,178,059, Cl. 339-115.00R.

Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, to BBC Brown Boveri & Company, Limited. Method for the production marking of liquid displays. 4,177,729, Cl. 101-129.000.

Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., to Iowa State University Research Foundation, Inc. Compactor device for large round bales. 4,177,723, Cl. 100-8.000.

Budd, Tom A.: *See*—
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,177,724, Cl. 100-26.000.

Budzyn, Boleslaw L.: *See*—
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., 4,177,622, Cl. 53-511.000.

Bunch, Robert E. Tool for flaring pipe end portions. 4,178,148, Cl. 425-393.000.

Bunker Ramo Corporation: *See*—
Coleman, Dennis C., 4,177,680, Cl. 73-718.000.
Marz, Frank H., 4,177,630, Cl. 58-7.000.

Burg, Karlheinz: *See*—
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.

Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, to Didier Engineering GmbH. Process for conveying hot crude coke oven gas from coke ovens to a position of utilization while preventing condensation of higher hydrocarbons. 4,178,266, Cl. 252-373.000.

Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, to Ebauches Electroniques S.A. Electronic watch. 4,177,632, Cl. 58-23.0BA.

Burroughs Corporation: *See*—
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., 4,177,727, Cl. 101-93.140.

Burroughs Wellcome Co.: *See*—
Krenitsky, Thomas A.; and Bushby, Stanley R. M., 4,178,212, Cl. 195-63.000.

Burton, Robert S., III, to Occidental Oil Shale, Inc. Water treatment and heating in spent shale oil retort. 4,178,039, Cl. 299-2.000.

Busch, Gerhard. Arrangement for turning, multiple stacking and aligning a paper stack. 4,178,119, Cl. 414-28.000.

Busch, Walter; Holst, Arno; and Fischer, Wilhelm, to Hoechst Aktiengesellschaft. Sheet-like structure of polyvinyl chloride, which is capable of absorbing water vapor and transmitting water vapor. 4,178,271, Cl. 260-17.00R.

Bushby, Stanley R. M.: *See*—
Krenitsky, Thomas A.; and Bushby, Stanley R. M., 4,178,212, Cl. 195-63.000.

Busse, Joseph F.: *See*—
Schmidt, Daniel R., Jr.; and Busse, Joseph F., 4,178,576, Cl. 343-781.00R.

C. F. Sauer Company, The: *See*—
Cleevely, Bruce T., 4,177,932, Cl. 220-307.000.

C. Keller GmbH u. Co. KG: *See*—
Steingrover, Horst, 4,177,890, Cl. 198-434.000.

C. R. Bard, Inc.: *See*—
Bevilacqua, Albert J., 4,177,817, Cl. 128-802.000.

C. W. Zumbiel Company, The: *See*—
Lane, Robert W., 4,177,918, Cl. 229-39.00B.

Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., to Electric Power Research Institute, Inc. Compatible mixtures of coal liquids and petroleum based fuels. 4,178,226, Cl. 208-15.000.

Caelter Enterprises, Ltd.: *See*—
Martineau, Jacques, 4,178,007, Cl. 280-80.00R.

Calienes, Miguel. Multi-reflection clock. 4,177,634, Cl. 58-50.00R.

Callen, Robert B.: *See*—
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.

Cameron, Robert G.: *See*—
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000.

Camilleri, Thomas M. Pin orientator. 4,177,988, Cl. 273-43.00D.

Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., to Monsanto Company. Oxidative dehydrogenation of propionitrile to acrylonitrile. 4,178,305, Cl. 260-465.900.

Campbell, David N., to Hymatic Engineering Company Limited, The. Cryogenic cooling apparatus. 4,177,650, Cl. 62-222.000.

Campbell, Gene E. Coin drop game. 4,177,986, Cl. 273-1.00L.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Powell, Peter J.; and Nagy, Gerard D., 4,178,339, Cl. 264-61.000.
Canevet, Georges: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Cannon Limited: *See—*
Brooks, Alfred W., 4,177,575, Cl. 34-13.000.
Canon Kabushiki Kaisha: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, 4,177,757, Cl. 118-658.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.
Tsuji, Sadahiko; and Agari, Yujiro, 4,178,076, Cl. 350-184.000.
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, to Montedison S.p.A. Processes for preparing perfluoropolyether oils of very high purity and low volatility. 4,178,465, Cl. 568-601.000.
Carbone, Bernard: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Carborundum Company, The: *See—*
DeMunda, Gabriel P., 4,178,413, Cl. 428-408.000.
Carbrey, Robert L., to Bell Telephone Laboratories, Incorporated. Signal multiplexing circuit. 4,178,480, Cl. 179-15.0BM.
Cargill, Incorporated: *See—*
Nollet, Anthony R., 4,178,232, Cl. 209-3.000.
Carian, Lawrence T.: *See—*
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., 4,177,727, Cl. 101-93.140.
Carl Freudenberg, Firma: *See—*
Kayser, Ernst, 4,178,002, Cl. 277-212.000.
Carl Zeiss-Stiftung: *See—*
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl. 33-174.00L.
Carlock, John T., to Conoco, Inc. Iridium or rhodium catalysts for hydroformylation and isomerization of olefins. 4,178,312, Cl. 260-604.0HF.
Carlock, John T., to Conoco, Inc. Olefin isomerization and hydroformylation process. 4,178,313, Cl. 260-604.0HF.
Carlock, John T., to Conoco, Inc. Iridium or rhodium trihalide polymer bound hydrogenation and hydroformylation catalyst. 4,178,314, Cl. 260-604.0HF.
Carney, Robert L.: *See—*
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100.
Carniselli, Giuliano: *See—*
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.
Carpenter, Howard F.: *See—*
Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., 4,177,813, Cl. 128-326.000.
Carr, John B., to Shell Oil Company. Benzopyrancarboxamides. 4,178,380, Cl. 424-283.000.
Carr-Rollett, Derrick. Sanding and buffing attachment for power tools. 4,177,611, Cl. 51-376.000.
Carroll, James C.: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.
Cartwright, James M., Jr.: *See—*
Hsu, Sheng T.; and Cartwright, James M., Jr., 4,178,605, Cl. 357-42.000.
Cartwright, John N., to General Motors Corporation. Floating seal. 4,177,997, Cl. 277-27.000.
Caswell, Bruce F., to Arcanum Corporation. Process for preparing agglomerates of clays. 4,178,341, Cl. 264-117.000.
Caterpillar Tractor Co.: *See—*
Phelps, Weldon L., 4,178,518, Cl. 307-9.000.
Catoni, Mario: *See—*
Mattone, Roberto; and Catoni, Mario, 4,178,287, Cl. 260-239.30A.
Cavier, Adolf J. J. F.; and Maass, Rudolf. Slicing machine for salmon. 4,177,703, Cl. 83-356.300.
Centanni, Michael J., to Continental Group, Inc., The. Lined bulk container and method of forming same. 4,177,935, Cl. 220-417.000.
Certain-teed Corporation: *See—*
Kinard, Gerald W., 4,177,726, Cl. 100-214.000.
Chakrabarti, Paritosh M., to GAF Corporation. Method of increasing the strength of wet glass fiber mats made by the wet-laid process. 4,178,203, Cl. 162-156.000.
Chakrabarti, Paritosh M., to GAF Corporation. Wet-strength of wet glass fiber mats by treatment with anionic polyelectrolytes. 4,178,204, Cl. 162-156.000.
Chakrabarti, Paritosh M., to GAF Corporation. Method of forming glass fiber dispersions with cationic quaternary ammonium surfactants having at least two long chain groups. 4,178,206, Cl. 162-156.000.
Chamdru, Jacques, to Regie Nationale des Usines Renault. Blow nozzle, notably for foundry cores. 4,177,857, Cl. 164-200.000.
Champion International Corporation: *See—*
Webinger, George P., 4,177,917, Cl. 229-34.0HW.
Champion, James R.; and Seigal, Steven D., to International Business Machines Corporation. Abnormally low reflectance photoconductor sensing system. 4,178,095, Cl. 355-14.00R.
Chang, Bong H., to Exxon Research & Engineering Co. Thermal cracking of gas oil to middle distillate. 4,178,228, Cl. 208-72.000.
Chang, Tommy J. C. Automatic golf ball teeing apparatus. 4,177,996, Cl. 273-201.000.
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., to Standard Oil Company a corporation of Indiana. Process for improving the functional properties of protein material. 4,178,391, Cl. 426-61.000.
Chapman, Andrew W. Orthopedic shoe with forefoot protective guard. 4,177,583, Cl. 36-77.00R.
Chapman, Craig A.: *See—*
Allen, Gerald L.; and Chapman, Craig A., 4,178,346, Cl. 422-126.000.
Chapman, David, to Acrow (Engineers) Limited. Concrete formwork soldier. 4,177,968, Cl. 249-211.000.
Charron, Marcel. Door lock guard. 4,178,027, Cl. 292-346.000.
Chattha, Mohinder, to Ford Motor Company. High solids coating composition with oligomeric hydroxyphosphate catalyst-C. 4,178,320, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with oligomeric hydroxyphosphate catalyst-A. 4,178,319, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids composition with hydroxy functional acrylic organophosphate reactive catalyst - I. 4,178,321, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with acrylic hydroxyphosphate catalyst-III. 4,178,322, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with hydroxy functional acrylic organophosphate reactive catalyst-II. 4,178,323, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with oligomeric hydroxy phosphate catalyst-B. 4,178,324, Cl. 525-188.000.
Checcacci, Basilio: *See—*
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, 4,177,859, Cl. 165-11.000.
Chemonic Industries, Inc.: *See—*
Hall, Seymour G.; and Mason, Edward D., 4,178,399, Cl. 427-381.000.
Chen, Augustin T.; and Onder, Kemal B., to Upjohn Company, The. Copolyoxalamide from branched chain diamine. 4,178,432, Cl. 528-340.000.
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, to Regie Nationale des Usines Renault. Device for driving panels in conveyance, especially horizontally-sliding windows in an automobile. 4,177,605, Cl. 49-98.000.
Cherne Industries, Inc.: *See—*
Anderson, Charles E., 4,177,559, Cl. 30-105.000.
Cheung, Mo-Fung, to Ford Motor Company. Graft polybutadiene copolymers. 4,178,318, Cl. 525-77.000.
Chevron Research Company: *See—*
Hickson, Donald A., 4,177,653, Cl. 62-534.000.
King, John M., 4,178,259, Cl. 252-42.700.
Chinook Manufacturing Co.: *See—*
Johnson, William R., 4,177,793, Cl. 121-121.000.
Chister, Rene A.: *See—*
Matuschek, Josip; and Chister, Rene A., 4,177,710, Cl. 85-70.000.
Chiyoda Chemical Engineering & Construction Company, Ltd.: *See—*
Asanagi, Etsuo; and Idemura, Hideo, 4,178,348, Cl. 423-242.000.
Choi, Eun S. Automated mechanism for imparting movement to limbs of a mechanical toy. 4,177,602, Cl. 46-150.000.
Chon, Pyong H. Portable fishing rod holder and stand. 4,177,595, Cl. 43-21.200.
Christoph, Dieter: *See—*
Schulz, Siegfried, 4,177,701, Cl. 82-39.000.
Chromatix, Inc.: *See—*
Wallace, Richard W., 4,178,103, Cl. 356-336.000.
Chupa, Charles M.: *See—*
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,190, Cl. 156-110.00R.
Ciba-Geigy Aktiengesellschaft: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Gagneux, Andre, 4,178,378, Cl. 424-269.000.
Lee, Peter I.; and Holt, Brian, 4,178,253, Cl. 252-47.000.
Nachbur, Hermann; and Rohringer, Peter, 4,178,398, Cl. 427-379.000.
Cicci, George B., to International Harvester Company. Header suspension. 4,177,627, Cl. 56-15.800.
Cigognini, Luciano: *See—*
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to BASF Wyandotte Corporation. Compositions for souring and softening

laundered textile materials, method of preparing the same, and stock solutions prepared therefrom. 4,178,256, Cl. 252-8.750.
Cincinnati Milacron Inc.: *See—*
Anthony, Donald W., 4,178,632, Cl. 364-513.000.
Cini, Hector J.; and Meyers, Theodore J., to United States of America, Navy. Low frequency hydrophone. 4,178,577, Cl. 367-159.000.
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., to Eastman Kodak Company. Thiazolyl coupler compositions and photographic elements suited to forming integral sound tracks. 4,178,183, Cl. 96-74.000.
Clanton, W. Porter, to Quaker Oats Company, The. Toy stethoscope. 4,177,871, Cl. 181-131.000.
Claremont Polychemical Corporation: *See—*
Bae, Kook J., 4,178,282, Cl. 260-45.75W.
Clarion Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,178,552, Cl. 325-479.000.
Clarke, C. William: *See—*
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.
Clavin, Edward A., to Midcon Pipeline Equipment Co. Rotary internal pipe clamp apparatus. 4,177,914, Cl. 228-49.00B.
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., to Hoffmann-La Roche Inc. Radiolabelled rubella virus and method. 4,178,360, Cl. 424-1.000.
Cleevely, Bruce T., to C. F. Sauer Company, The. Thermoplastic container for storing and dispensing solid particulate material. 4,177,932, Cl. 220-307.000.
Clegg, Russell B.: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,178,192, Cl. 148-1.500.
Coats, Billy C. Hypoallergenic stabilized aloe vera gel. 4,178,372, Cl. 424-195.000.
Cobbs, James H. Liner for large diameter borehole. 4,178,110, Cl. 405-133.000.
Coffey, James G. Mount for a communication device or the like. 4,178,060, Cl. 339-125.00R.
Cogswell, Frederic N.: *See—*
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., to Union Corporation. Sustained release pharmaceutical composition. 4,178,361, Cl. 424-22.000.
Cole, Bernie R. Polishing apparatus. 4,177,535, Cl. 15-97.00R.
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, to Imperial Chemical Industries, Limited. Fibre expanded reinforced materials and their process of manufacture. 4,178,411, Cl. 428-310.000.
Cole, Terrell A. Wound roll of fibrous material. 4,177,897, Cl. 206-389.000.
Coleman, Dennis C., to Bunker Ramo Corporation. Dual pressure sensor. 4,177,680, Cl. 73-718.000.
Colgate-Palmolive Company: *See—*
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., 4,178,255, Cl. 252-8.800.
Collins, Martin F.; and Michalek, Romuald, to Engelhard Minerals & Chemicals Corp. Removal of tritium and tritium-containing compounds from a gaseous stream. 4,178,350, Cl. 423-248.000.
Combustion Engineering Inc.: *See—*
Makuch, John A., 4,177,951, Cl. 241-35.000.
Comer, William T.: *See—*
Martin, Tellis A.; and Comer, William T., 4,178,301, Cl. 260-455.00R.
Commissariat a l'Energie Atomique: *See—*
Lauro, Fernand; and Podevin, Roland, 4,178,021, Cl. 285-255.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Bedding, Robin A., 4,178,366, Cl. 424-93.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Maury, Christian, 4,178,560, Cl. 331-1.00A.
Compton, John W.; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Spotting-agent composition. 4,178,262, Cl. 252-162.000.
Conoco, Inc.: *See—*
Carlock, John T., 4,178,312, Cl. 260-604.0HF.
Carlock, John T., 4,178,313, Cl. 260-604.0HF.
Carlock, John T., 4,178,314, Cl. 260-604.0HF.
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.
Constable, Douglas W.; and Lovely, John D., to GTE Sylvania Incorporated. Clamp circuit for RGB output stages. 4,178,610, Cl. 358-34.000.
Continental Group, Inc., The: *See—*
Centanni, Michael J., 4,177,935, Cl. 220-417.000.
Kinsley, John P., 4,178,146, Cl. 425-289.000.
Control Logic (Proprietary) Limited: *See—*
Moshal, John H., 4,177,774, Cl. 123-102.000.
Cook, Brian A.; and Brown, Thomas W., to Exxon Research & Engineering Co. Ester based metal working lubricants. 4,178,260, Cl. 252-49.800.
Cook, Weldon R. Cat scratching post assembly. 4,177,763, Cl. 119-29.000.
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., to Burroughs Corporation. Line printer character chain lubricating device. 4,177,727, Cl. 101-93.140.
Copal Company Limited: *See—*
Fukawa, Kazumi, 4,178,616, Cl. 360-74.100.
Copp, Carl A., Jr.: *See—*
Reid, Earl; and Copp, Carl A., Jr., 4,178,136, Cl. 417-269.000.
Corraz, Alfred J.: *See—*
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.
Corti, Costante: *See—*
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.
Corwin, Edward J. Marking message card and template assembly and related input switching circuitry and method of making the assembly. 4,178,503, Cl. 235-495.000.
Cosgrove, James F.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., to Modine Manufacturing Company. Recuperator structure. 4,177,861, Cl. 165-101.000.
Couchoud, Paul, to Rhone-Poulenc-Textile. Compounds for obtaining polymeric flameproofing agents and the process for obtaining them, as well as the flameproofing agents thus obtained. 4,178,283, Cl. 260-45.85R.
Councill, Craig A. Modular container. 4,178,249, Cl. 210-281.000.
Courty, Aurele. Tube cutter with a ratchet handle. 4,177,557, Cl. 30-102.000.
Cova, Dario R.: *See—*
Baker, Joseph W.; Cova, Dario R.; and White, James E., 4,178,353, Cl. 423-300.000.
Covington, Wayne F.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Cowpland, Michael C. J.; and Beirne, Patrick R., to Mitel Corporation of Kanata. Transformerless telephone line circuit. 4,178,485, Cl. 179-18.0FA.
Crabiel, Wesley I., to Dresser Industries, Inc. Swivel joint for a vehicle. 4,177,869, Cl. 180-6.580.
CRAF Sud: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.
Cragoe, Edward J., Jr.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Crain, Donald L.: *See—*
Shue, Robert S.; and Crain, Donald L., 4,178,276, Cl. 260-37.00R.
Cramer, John J.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,178,256, Cl. 252-8.750.
Crapo, Roland L., to Superior Electric Company, The. Stepping AC line voltage regulator. 4,178,539, Cl. 323-45.000.
Crawford, Millard B., to Kaiser Aluminum & Chemical Corporation. Self-grinding valve mechanism. 4,177,825, Cl. 137-243.200.
Cremer, Gerhard: *See—*
Bischkopf, Gerd; Gawarecki, Herbert; and Cremer, Gerhard, 4,177,544, Cl. 28-119.000.
Cribbs, John R. Damped automatic variable valve timing device for internal combustion engines. 4,177,773, Cl. 123-90.150.
Crisci, Victor E., to Polysar Resins, Inc. Closure having opening means. 4,177,930, Cl. 220-284.000.
Crosby, Bruce R.; and Spector, George. Variable block puzzle and container. 4,177,993, Cl. 273-160.000.
Croset, Michel; and Velasco, Gonzalo, to Thomson - CSF. Galvanic cell for the electrochemical production or storage of electrical energy. 4,178,418, Cl. 429-27.000.
CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Di Vita, Pietro, 4,178,066, Cl. 350-96.180.
Cubic Western Data: *See—*
Adams, Ralph D.; and Wyckoff, James K., 4,177,889, Cl. 194-1.00B.
Cummins, Earl W.: *See—*
Adams, Charles D.; Cummins, Earl W.; and Gleich, Steven I., 4,178,448, Cl. 544-194.000.
Cunningham, Donald M., to Emerson Electric Co. End seals for electric immersion heating elements. 4,178,497, Cl. 219-336.000.
Curtis Dyna Products Corporation: *See—*
Curtis, Russell R.; and Schlensker, Albert L., 4,177,949, Cl. 239-582.000.
Stevens, Robert E.; and Schlensker, Albert L., 4,177,937, Cl. 222-63.000.
Curtis, Russell R.; and Schlensker, Albert L., to Curtis Dyna Products Corporation. Fog generating apparatus. 4,177,949, Cl. 239-582.000.
Cutting Room Appliances Corporation: *See—*
Melega, Albert, 4,177,980, Cl. 270-31.000.
CUV "Progress": *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.
Czeiner, Joseph A. Unitized roof and ceiling subassembly. 4,177,613, Cl. 52-86.000.

Cziptschirsch, Kurt, to Gebr. Happich GmbH. Sun visor for motor vehicles. 4,178,035, Cl. 296-97.00K.

Dahlgrun, Rolf: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,177,670, Cl. 73-38.000.

Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf; and Knoll, Heinz W., 4,178,016, Cl. 280-734.000.
Scheying, Heinz, 4,178,141, Cl. 417-498.000.
Zeilinger, Karl; and Bachschmid, Reiner, 4,177,689, Cl. 74-242.800.

Daimon, Hiroshi: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Dainippon Ink & Chemicals, Inc.: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.

Daishin Kako Co., Ltd.: *See—*
Suzuki, Hiroyuki, 4,177,943, Cl. 222-591.000.

Dale Electronics, Inc.: *See—*
Kneifel, Jerome J., 4,178,545, Cl. 324-158.00F.

Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., to Faser Industries. Method of forming a sterilizable package with tear-off indicators. 4,177,620, Cl. 53-425.000.

Daman, Ernest L.; and McCallister, Robert A., to Foster Wheeler Energy Corporation. Heat exchanger. 4,177,858, Cl. 165-11.000.

Damon Corporation: *See—*
Gourlandt, Albert J., 4,177,810, Cl. 128-218.00A.
Sodickson, Lester A., 4,178,153, Cl. 23-230.00R.

Danfoss A/S: *See—*
Tankred, Hans J., 4,178,140, Cl. 417-415.000.

Daniels, Erwin J.: *See—*
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.

Daniels, Peter J. L.; and Varchei, Mohammed M. N., to Schering Corporation. Process for the preparation of 2,5-dideoxystreptamine and of a novel intermediate therefor. 4,178,453, Cl. 548-369.000.

Danjushevsky, Solomon I.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Dansk Industri Syndikat AS: *See—*
Jespersen, Emil; and Mogensen, Vagn, 4,177,892, Cl. 198-832.000.

Darmo Corporation: *See—*
Moses, Darcy C., 4,177,683, Cl. 74-200.000.

Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Camera with a device for protecting film against fogging. 4,178,086, Cl. 354-152.000.

Daum, Werner: *See—*
Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, 4,178,383, Cl. 424-304.000.

Dauvergne, Hector A. Bucket-less turbine wheel. 4,178,125, Cl. 415-80.000.

David Brown Tractors Limited: *See—*
Sykes, Alec, 4,178,042, Cl. 301-9.0TV.

Davis, Bryan T., to Ethyl Corporation. Fuel compositions. 4,177,768, Cl. 123-1.00A.

Davis, Edwin W., to Eastern Company, The. Cabinet lock. 4,177,656, Cl. 70-84.000.

Davis, William F., to Motorola, Inc. Integrated injection logic digital-to-analog converter employing feedback regulation and method. 4,178,584, Cl. 340-347.0DA.

Dawson, Daniel J.: *See—*
Otteson, Kenneth M.; and Dawson, Daniel J., 4,178,422, Cl. 525-336.000.

Dayco Corporation: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.
Jacob, Richard J., 4,177,686, Cl. 74-231.0CB.

Decker, John J.; and Kantner, Donald J., to GTE Sylvania Incorporated. Method for making a glass-to-metal seal for electrocheimcal cells. 4,178,164, Cl. 65-59.00R.

Deconinck, Didier, to Allibert Exploitation. Bathroom wall fixture. 4,177,901, Cl. 211-105.100.

Deere & Company: *See—*
Henn, John L., 4,177,870, Cl. 180-243.000.
Peiler, Rolf W.; and Rohren, Ronald E., 4,177,821, Cl. 130-27.00T.
Sikula, William J., Jr., 4,177,529, Cl. 7-100.000.
Thompson, James E., 4,177,836, Cl. 138-30.000.
Wood, Homer J., 4,177,638, Cl. 60-39.51H.

de Fluiter, Ruurd: *See—*
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.

Dekker, Pieter: *See—*
Argyle, Bernell E.; Slonczewski, John C.; and Dekker, Pieter, 4,178,636, Cl. 365-30.000.

DeKluyver, Peter J.: *See—*
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.

de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., to Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.; and Scheepswerf en Machinefabriek "De Liesbosch" B.V. Method and apparatus for dredging. 4,177,585, Cl. 37-67.000.

Delalande S. A.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.

DeLancey, Warren H. Pulley. 4,177,685, Cl. 74-230.700.

Delfosse, Gilbert, to Braud, Societe Anonyme. Conveyor belt deformable in space. 4,177,891, Cl. 198-570.000.

Delory, Bernard: *See—*
Ribout, Pierre; and Delory, Bernard, 4,178,533, Cl. 315-3.600.

Delta Plastics Limited: *See—*
Slater, Paul, 4,177,760, Cl. 119-14.080.

DeLuca, Anthony; and DeLuca, Josephine. Thermal block. 4,177,617, Cl. 52-562.000.

DeLuca, Josephine: *See—*
DeLuca, Anthony; and DeLuca, Josephine, 4,177,617, Cl. 52-562.000.

Demain, Arnold L.; and Kohsaka, Masanobu, to Massachusetts Institute of Technology. Accellular synthesis of cephalosporins. 4,178,210, Cl. 195-29.000.

DeMunda, Gabriel P., to Carborundum Company, The. Fiber reinforced carbon and graphite articles and a method of producing said articles. 4,178,413, Cl. 428-408.000.

Denk, Hans; and Reeh, Ulrike, to Siemens Aktiengesellschaft. Casting resin compositions for sealing opto-electronic components. 4,178,274, Cl. 260-31.80E.

Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., to Hughes Aircraft Company. Soldering method and solder joint. 4,177,916, Cl. 228-231.000.

Denney, James H., to Vector Engineering Corporation. Handhold insert for a twisted rope. 4,177,542, Cl. 24-115.00R.

De Pedro, Francisco L. Self attachable small-toothed electrode and a forceps for maneuvering it. 4,177,818, Cl. 128-418.000.

Deprez, Dominique: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys, 4,178,325, Cl. 525-157.000.

Detectors, Inc.: *See—*
Rubey, Ulyss R., 4,177,751, Cl. 116-201.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Klebe, Hans; and Knippschild, Gerd, 4,178,351, Cl. 423-275.000.
Kunst, Helmut; and Wahl, Georg, 4,178,244, Cl. 210-71.000.

Development Finance Corporation of New Zealand: *See—*
Ayers, John S.; and Husbands, David R., 4,178,439, Cl. 536-59.000.

Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., to Western Electric Co., Inc. Assembling leads to a substrate. 4,177,554, Cl. 29-626.000.

DeVore, Wilfred H. Door mounting, opening and locking apparatus for buildings conforming to sloping terrain. 4,177,854, Cl. 160-207.000.

DeVries, James L.: *See—*
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., 4,177,667, Cl. 73-1.00G.

Dexter, Edwin M.: *See—*
Brakebill, Harold G.; and Dexter, Edwin M., 4,177,924, Cl. 236-86.000.

Dhein, Rolf; and Hentschel, Karl-Heinz, to Bayer Aktiengesellschaft. Carboxylic acid esters and their use as a base lubricating oil. 4,178,261, Cl. 252-57.000.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Method for the treatment of arrhythmia. 4,178,387, Cl. 424-322.000.

Didier Engineering GmbH: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.

Diehl, Karl-Heinz: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,178,375, Cl. 424-248.400.

Dietze, Wolfgang: *See—*
Reutter, Jorg; and Dietze, Wolfgang, 4,178,569, Cl. 333-119.000.

Dill, Hans G.: *See—*
Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, 4,177,632, Cl. 58-23.0BA.

Dilley, Gerald G., to Peters Equipment Corporation. Tying machine. 4,177,842, Cl. 140-93.600.

Dillow, John P. Appendage for a fishhook. 4,177,596, Cl. 43-36.000.

Di Vita, Pietro, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Ray-path equalizer for signal-transmission system using multimode light guides. 4,178,066, Cl. 350-96.180.

Doi, Hachiro: *See—*
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.

Dolinsek, Hans, to Johannes Fuchs, Firma. Grapple or grab-bucket safety mechanism. 4,178,030, Cl. 294-70.000.

Dombrowski, Anthony E. Fuel saving signaling apparatus for a motor vehicle. 4,178,580, Cl. 340-52.00D.

Donigian, Doulgas W., to Westvaco Corporation. Whiskering test apparatus. 4,177,672, Cl. 73-150.00R.

Donnini, Edlo. Garden crook. 4,177,864, Cl. 172-371.000.

Dopyera, Emil E., to Big-Inch Marine Systems, Inc. Locking slip joint and method of use. 4,178,020, Cl. 285-18.000.
Dorogi, Jozsef: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.
Dorsen, Mac; and Saltzman, Philip A., to Stupell Industries, Inc. Name plate assembly for tote bag and the like. 4,177,587, Cl. 40-16.000.
Douglas, George H.: *See—*
Diamond, Julius; and Douglas, George H., 4,178,387, Cl. 424-322.000.
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., to Mattel, Inc. Captive flying toy airplane having simulated motor sounds. 4,177,984, Cl. 272-31.00A.
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V. Method of machining end faces. 4,177,699, Cl. 82-1.00C.
Dow Chemical Company, The: *See—*
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,178,327, Cl. 525-169.000.
Priddy, Duane B., 4,178,263, Cl. 252-186.000.
Smith, Harry A., 4,178,433, Cl. 528-381.000.
Wagner, Eugene R.; and Renzi, Alfred A., 4,178,385, Cl. 424-310.000.
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., 4,178,205, Cl. 162-168.00R.
Dowd, Patrick: *See—*
Thompson, John J.; Gorman, Paul D.; and Dowd, Patrick, 4,177,591, Cl. 40-343.000.
Dowdell, Toy, Jr.: *See—*
Hulls, Leonard R.; and Dowdell, Toy, Jr., 4,178,546, Cl. 324-158.0MG.
Dowell, Terrence P.; and Banks, Edwin L., Jr., to Barry Wright Corporation. Mechanical snubbing device with inertia actuated braking means. 4,177,882, Cl. 188-1.00B.
Dresser Industries, Inc.: *See—*
Crabiel, Wesley I., 4,177,869, Cl. 180-6.580.
Fertl, Walter H., 4,178,506, Cl. 250-260.000.
Mitchell, Howard E., 4,177,866, Cl. 175-53.000.
Drkal, Jan: *See—*
Kovar, Jan; and Drkal, Jan, 4,177,660, Cl. 72-108.000.
Dubernard Hospital, S.A.: *See—*
Grangirard, Henri; and Serres, Pierre F., 4,177,801, Cl. 128-2.05M.
Du Bois, Edward F.; and Papastrat, Arthur L., to Singer Company, The. Method and apparatus for safely feeding a machine manually. 4,177,666, Cl. 72-420.000.
Dubois, Jaques, deceased; and Zulliger, Hans R., to Nuclear Semiconductor. Art object analyzer. 4,178,513, Cl. 250-491.000.
Duchateau, Jean L.; and Sautiere, Bernard E., to Foseco Trading A.G. Tundish and method of pouring molten metal therewith. 4,177,855, Cl. 164-82.000.
Dudley, Dana; and Knight, William M., Jr., to Texas Instruments Incorporated. Delta frame circuit. 4,178,612, Cl. 358-167.000.
Duff, James A.: *See—*
Green, Paul N.; and Duff, James A., 4,177,899, Cl. 206-509.000.
Dunn, William H.: *See—*
Wurst, John W.; and Dunn, William H., 4,177,744, Cl. 112-158.00E.
Dunnigan, Daniel A., to Abbott Laboratories. Process for preparing 1,3-diacyl glycerols. 4,178,299, Cl. 260-409.000.
Du Pont de Nemours, E. I., and Company: *See—*
Adams, Charles D.; Cummins, Earl W.; and Gleich, Steven I., 4,178,448, Cl. 544-194.000.
Memeger, Wesley, Jr., 4,178,419, Cl. 521-89.000.
Durkin, Joanne: *See—*
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000.
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., to Branson Ultrasonics Corporation. Method for cleaning workpieces by ultrasonic energy. 4,178,188, Cl. 134-1.000.
Dusza, John P.; and Albright, Jay D., to American Cyanamid Company. Pyrazolo[1,5-a]pyrimidines and imidazo-[1,5-a]pyrimidines. 4,178,449, Cl. 544-281.000.
Dykes, Willis G., to Lasco, Inc. Plant destruction using electricity. 4,177,603, Cl. 47-1.300.
Dynamics Corporation of America: *See—*
Lewison, Howard L., 4,177,865, Cl. 172-705.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Englaender, Fritz; and Kappler, Fritz Robert, 4,178,295, Cl. 260-343.30R.
Franz, Arnold; and Stein, Werner, 4,178,408, Cl. 428-285.000.
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.
Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.
Dynapol: *See—*
Otteson, Kenneth M.; and Dawson, Daniel J., 4,178,422, Cl. 525-336.000.
Dynic Corporation: *See—*
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, 4,177,586, Cl. 40-2.00R.
E M I Limited: *See—*
Hounsfield, Godfrey N.; and Waltham, Richard M., 4,178,511, Cl. 250-445.00T.
E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,178,291, Cl. 549-39.000.
Rovnyak, George C., 4,178,379, Cl. 424-273.00P.
Wade, Peter C.; and Vogt, B. Richard, 4,178,451, Cl. 546-272.000.
Eastern Company, The: *See—*
Davis, Edwin W., 4,177,656, Cl. 70-84.000.
Eastman Kodak Company: *See—*
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000.
Hector, Jean-Marie H.; and Pingaud, Bernard J., 4,178,416, Cl. 428-539.000.
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R.
Solomon, Victor C., 4,178,091, Cl. 354-322.000.
Vinal, Richard S., 4,178,180, Cl. 96-48.0PD.
Easton, James L.; and Filice, Gary W., to James D. Easton, Inc. Hollow bat and method of making. 4,177,989, Cl. 273-72.00A.
Eaton Corporation: *See—*
Geppert, Steven, 4,178,591, Cl. 340-685.000.
Swanson, Wesley S., 4,178,573, Cl. 335-255.000.
Ebauches Electroniques S.A.: *See—*
Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, 4,177,632, Cl. 58-23.0BA.
Ebauches S.A.: *See—*
Rusznyak, Andreas, 4,178,520, Cl. 307-255.00C.
Ebnother, Anton: *See—*
Rissi, Erwin; and Ebnother, Anton, 4,178,377, Cl. 424-267.000.
Edelson, Stanley; and Feinberg, Samuel, to Amsterdam Brush Company. Paint brush merchandising display. 4,177,903, Cl. 211-49.00D.
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., to U.S. Philips Corporation. Horn antenna with rotating waveguide and polarization lens means. 4,178,574, Cl. 343-756.000.
Eder, Ulrich: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.
Ederer Incorporated: *See—*
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.
Edwards, Grant C.: *See—*
Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., 4,178,352, Cl. 423-329.000.
Edwards, John A.: *See—*
Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., 4,178,457, Cl. 560-53.000.
Edwin Cooper, Inc.: *See—*
Papay, Andrew G.; and Zaweski, Edward F., 4,178,258, Cl. 252-32.70E.
Efendiev, Medzhid R. O.: *See—*
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.
Eggensperger, Heinz; and Diehl, Karl-Heinz, to Sterling Drug Inc. Preserving and disinfecting method employing certain oxazines. 4,178,375, Cl. 424-248.400.
Egorov, Georgy B.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Ehret, Rudolf: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.
Ehrlich, Johann, Jr. Sole for shoes and process for the production thereof. 4,177,582, Cl. 36-33.000.
Eifort, Ralph C., to NCR Corporation. Zero-insertion force electrical connector. 4,178,053, Cl. 339-75.0MP.
Eisenstein, Stephen E.: *See—*
Compton, John W.; and Eisenstein, Stephen E., 4,178,262, Cl. 252-162.000.
Ekbom, Roger A.; and Friedlander, Sidney, to Tronomed, Inc. Medical terminal clip member for attachment to patient electrodes. 4,178,052, Cl. 339-61.00R.
Elder, Eugene E. Adjustable nose piece assembly for eyeglasses. 4,178,080, Cl. 351-137.000.
Electric Power Research Institute, Inc.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.
Elie, David K.: *See—*
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 4,177,758, Cl. 119-3.000.
Elliott Brothers (London) Limited: *See—*
Heller, Fritz P., 4,178,074, Cl. 350-171.000.
Elting, Larry M. Oscillating soot blower mechanism. 4,177,539, Cl. 15-316.00R.
Emerson Electric Co.: *See—*
Cunningham, Donald M., 4,178,497, Cl. 219-336.000.
Frank, William H., 4,177,879, Cl. 182-220.000.
Krump, Robert C., 4,177,923, Cl. 236-46.00R.
Lyerly, Harold G., 4,178,523, Cl. 310-71.000.
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., to Sybron Corporation. Measuring sensor for capacitive measurement of liquids at selected levels. 4,178,623, Cl. 361-284.000.
Emmons, J. Bruce, to Outboard Marine Corporation. Two staged carburetor with arrangement for reducing fuel spillage. 4,178,331, Cl. 261-23.00A.

Emmons, William D.; and Nyi, Kayson, to Rohm and Haas Company. Polyurethane coating compositions containing unsaturated esters of glycol monodicyclopentenyl ethers. 4,178,425, Cl. 528-73.000.

Energy Conversion Devices, Inc.: *See—*
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,178,415, Cl. 428-446.000.

Engeler, William E.; and Baertsch, Richard D., to General Electric Company. Input circuit for charge transfer apparatus. 4,178,519, Cl. 307-221.00D.

Engelhard Minerals & Chemicals Corp.: *See—*
Collins, Martin F.; and Michalek, Romuald, 4,178,350, Cl. 423-248.000.

Enger, Carl C. Implantable biotelemetry transmitter and method of using same. 4,177,800, Cl. 128-2.10A.

Englaender, Fritz; and Kappler, Fritz Robert, to Dynamit Nobel Aktiengesellschaft. Method of preparing phthalide. 4,178,295, Cl. 260-343.30R.

Ensing, Kenneth J., deceased (by Ensing, Lois K., executrix), to FMC Corporation. Pyrethroid insect repellent. 4,178,384, Cl. 424-305.000.

Ensing, Lois K., executrix: *See—*
Ensing, Kenneth J., deceased, 4,178,384, Cl. 424-305.000.

Enso-Gutzeit Osakeyhtio: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Enterprises International, Inc.: *See—*
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.

Entner, Josef, to Hilti Aktiengesellschaft. Self-drilling dowel with an inclined rolling head. 4,177,867, Cl. 175-400.000.

Envirotech Corporation: *See—*
Rahman, Michael, 4,178,160, Cl. 55-436.000.

Epshtein, Yakov V.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Erlichman, Irving, to Polaroid Corporation. Transfer or recording sheet having a textured surface. 4,178,598, Cl. 346-105.000.

Ethyl Corporation: *See—*
Davis, Bryan T., 4,177,768, Cl. 123-1.00A.
Leavitt, Richard I., 4,178,211, Cl. 195-30.000.

Ettenberg, Michael: *See—*
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.

Eue, Ludwig: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,178,166, Cl. 71-92.000.

Euteco S.p.A.: *See—*
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500.
Merli, Claudio; and Francia, Carlo, 4,177,852, Cl. 152-354.00R.

Evangelista, Fred J. Stringless electronic musical instrument. 4,177,705, Cl. 84-1.160.

Evans, John H., to Stant Manufacturing Company, Inc. Breakaway gas cap. 4,177,931, Cl. 220-288.000.

Evans, Leo G.: *See—*
Ruthel, Walter W.; and Evans, Leo G., 4,178,225, Cl. 204-279.000.

EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft: *See—*
Schmidt, Klaus, 4,177,720, Cl. 99-419.000.

Excel Plastic Products, Inc.: *See—*
Gruenewald, Manfred, 4,177,961, Cl. 242-85.100.

Exxon Research & Engineering Co.: *See—*
Chang, Bong H., 4,178,228, Cl. 208-72.000.
Cook, Brian A.; and Brown, Thomas W., 4,178,260, Cl. 252-49.800.
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,178,227, Cl. 208-50.000.

F. Zimmermann & Co.: *See—*
Zimmermann, Thomas, 4,178,502, Cl. 235-92.0CN.

Fach, Horst: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.

Facom: *See—*
Brihier, Gerard C. C., 4,178,541, Cl. 324-385.000.

Fagerlie, Richard A.: *See—*
Neff, James A.; and Fagerlie, Richard A., 4,177,840, Cl. 137-599.000.

Fairchild Camera and Instrument Corporation: *See—*
Lake, Don W.; and Subramanian, Nagaraja, 4,178,487, Cl. 179-90.0BD.

Falge, Peter: *See—*
Tudoriu, Theodor, 4,177,805, Cl. 128-79.000.

Fallos, George: *See—*
Orsinger, Winston A.; and Fallos, George, 4,177,979, Cl. 270-54.000.

Falluel, Jean-Pierre: *See—*
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.

Farge, Daniel: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.

Farkas, Kalman; and Krebs, Gary A., to Allis-Chalmers Corporation. Apparatus for machining large heavy workpieces in situs. 4,177,610, Cl. 51-241.00S.

Farmer, Robert L., to Phillips Petroleum Company. Balanced termination for a transmission line. 4,178,504, Cl. 250-199.000.

Faser Industries: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.

Fawcett, William E., to Kennametal Inc. Comminution machine with pulverizing blade assembly. 4,177,956, Cl. 241-188.00A.

Fecteau, Ronald D. Clean room filter assembly. 4,178,159, Cl. 55-385.00A.

Feder, Joseph: *See—*
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., 4,178,209, Cl. 195-1.800.

Feinberg, Samuel: *See—*
Edelson, Stanley; and Feinberg, Samuel, 4,177,903, Cl. 211-49.00D.

Fekete, Ference: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.

Felter, John V. Method and apparatus for installing insulation. 4,177,618, Cl. 52-743.000.

Felton, Bruce C.: *See—*
Allen, George W.; and Felton, Bruce C., 4,178,629, Cl. 363-96.000.

Felts, James M.; and Staprans, Ilona. Separation of active α_1-acid glycoprotein and utilization in the lipoprotein lipase enzyme system. 4,178,285, Cl. 260-112.00R.

Fennell Corporation: *See—*
James, William L.; and Wonso, Alex P., 4,177,754, Cl. 118-47.000.

Ferris, Donald L.; and Noehren, William L., to United Technologies Corporation. Helicopter rotor having lead-lag damper operable with pitch and flap decoupling. 4,178,130, Cl. 416-107.000.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,178,037, Cl. 297-326.000.

Fertl, Walter H., to Dresser Industries, Inc. Method for detecting fractures in formations surrounding earth boreholes. 4,178,506, Cl. 250-260.000.

Fetchin, John A.; and Tsu, Kin H., to American Cyanamid Company. Catalyst for hydration of nitriles. 4,178,310, Cl. 260-561.00N.

Fikentscher, Rolf: *See—*
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, 4,178,217, Cl. 204-55.00Y.

Filice, Gary W.: *See—*
Easton, James L.; and Filice, Gary W., 4,177,989, Cl. 273-72.00A.

Fillmore, F. Lawrence, to Teleflex Incorporated. Motion transmitting remote control assembly. 4,177,691, Cl. 74-501.00P.

Finch, Clyde E., Jr. Drilling rig heater. 4,177,792, Cl. 126-93.000.

Fischer, Johann P.: *See—*
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.

Fischer, Otto: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.

Fischer, Wilhelm: *See—*
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.

Fisher, Brian A.: *See—*
Blaiklock, William M.; and Fisher, Brian A., 4,177,538, Cl. 15-250.390.

Fisher, Charles B.; and Fisher, Sidney T. Sampling modulated waves. 4,178,553, Cl. 325-487.000.

Fisher, Sidney E.: *See—*
Jeavons, Philip S.; and Fisher, Sidney E., 4,177,606, Cl. 49-351.000.

Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,178,553, Cl. 325-487.000.

Fitzgerald, William C.: *See—*
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.

Flatland, Lloyd P. Dental handpiece connector. 4,177,564, Cl. 433-82.000.

Flatley, Doris W., to RCA Corporation. Process of making a planar MOS silicon-on-insulating substrate device. 4,178,191, Cl. 148-1.500.

Flavin, Thomas R.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.

Flee, Stephen L.: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.

Fleischhacker, James E.; and Wasserlein, Henry G., Jr., to AMP Incorporated. Connecting device for connecting pairs of wires. 4,178,055, Cl. 339-98.000.

Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, to Bergwerksverband GmbH. Process and installation for drying and heating coal. 4,178,150, Cl. 432-14.000.

Flockenhaus, Claus: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.

FMC Corporation: *See—*
Ensing, Kenneth J., deceased, 4,178,384, Cl. 424-305.000.

Foldes, Sandor: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.

Foley, James W.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,178,446, Cl. 544-33.000.
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Fontana, Pietro: *See—*
Stefani, Giancarlo; and Fontana, Pietro, 4,178,298, Cl. 260-346.750.
Food Technology Products: *See—*
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,370, Cl. 424-177.000.
Ford Aerospace & Communications Corp.: *See—*
Baumann, Erwin L., 4,178,627, Cl. 362-240.000.
Ford, Mack L., Jr.; and McFarland, William W., to International Paper Company. Variable flute container. 4,177,936, Cl. 220-441.000.
Ford Motor Company: *See—*
Anderson, Robert L., 4,177,770, Cl. 123-32.0EE.
Chattha, Mohinder, 4,178,320, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,319, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,321, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,322, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,323, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,324, Cl. 525-188.000.
Cheung, Mo-Fung, 4,178,318, Cl. 525-77.000.
Fork, Frank W., to H. H. Robertson Company. Closure device and floor structure utilizing the same. 4,178,469, Cl. 174-48.000.
Fortune, William S. Desoldering attachment for soldering instrument. 4,178,496, Cl. 219-230.000.
Foseco Trading A.G.: *See—*
Duchateau, Jean L.; and Sautiere, Bernard E., 4,177,855, Cl. 164-82.000.
Foster Wheeler Energy Corporation: *See—*
Daman, Ernest L.; and McCallister, Robert A., 4,177,858, Cl. 165-11.000.
Stewart, Robert D.; and Gamble, Robert L., 4,177,741, Cl. 110-263.000.
Foster, William A.: *See—*
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., 4,178,205, Cl. 162-168.00R.
Fowler, Stephen L., to W. R. Grace & Co. Uniformly irradiated polymer film. 4,178,220, Cl. 204-159.140.
Fowles, Thomas A.: *See—*
Winchell, David A.; and Fowles, Thomas A., 4,177,905, Cl. 215-246.000.
Foxx, Mary E.: *See—*
Klein, Robert W.; and Foxx, Mary E., 4,178,373, Cl. 424-233.000.
Francia, Carlo: *See—*
Merli, Claudio; and Francia, Carlo, 4,177,852, Cl. 152-354.00R.
Franco-Vila, Jose J. Magnetic thermal vibrational device for the treatment of arthritis and the like. 4,177,796, Cl. 128-1.500.
Frank, Earl E.; and Yee, Bing S., to Abex Corporation. Accumulator. 4,177,837, Cl. 138-31.000.
Frank, Louis M.: *See—*
Nunn, Robert G.; Frank, Louis M.; and Bittle, Ronald G., 4,178,589, Cl. 340-573.000.
Frank, William H., to Emerson Electric Co. Ladder and method of construction therefor. 4,177,879, Cl. 182-220.000.
Franke, Walter. Method of operating a four-stroke internal combustion engine and internal combustion engine for carrying out this method. 4,177,772, Cl. 123-75.00B.
Franks, Nelson J.: *See—*
Yarick, Jon R.; and Franks, Nelson J., 4,177,548, Cl. 29-453.000.
Franz, Arnold; and Stein, Werner, to Dynamit Nobel Aktiengesellschaft. Flame-proof epoxy fibrous structure and laminates thereof. 4,178,408, Cl. 428-285.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,178,236, Cl. 209-215.000.
Theurer, Josef, 4,178,237, Cl. 209-215.000.
Franzen, Jochen: *See—*
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.
Friday, John R.: *See—*
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.
Fried. Krupp Huttenwerke Aktiengesellschaft: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Friedenberg, Leonald W.; and Baker, James A., to Baker Engineering Enterprises Ltd. Spreader application rate monitoring device. 4,177,674, Cl. 73-198.000.
Friedenberg, Leonald W.; and Baker, James A., to Baker Engineering Enterprises Ltd. Spreader application rate monitoring device. 4,177,675, Cl. 73-198.000.
Friedlander, Sidney: *See—*
Ekbom, Roger A.; and Friedlander, Sidney, 4,178,052, Cl. 339-61.00R.
Friedman, David. Float controlled valves. 4,177,829, Cl. 137-426.000.
Friedrich Wilh. Schwing GmbH: *See—*
Schwing, Friedrich, 4,178,142, Cl. 417-516.000.
Friesen, David L. Drip-action hydroponic garden. 4,177,604, Cl. 47-62.000.
Frost, Edward G. Automatic nationwide paging system. 4,178,476, Cl. 179-2.0EC.
Frungel, Frank; and Gelbke, Eberhard, to Impulsphysik GmbH. Deep-water in-situ fluorometer. 4,178,512, Cl. 250-461.00R.
Fuchs, Francis J., Jr.: *See—*
Ahmed, Nazeer; and Fuchs, Francis J., Jr., 4,177,658, Cl. 72-60.000.
Fuchs, Hugo: *See—*
Horn, Peter; Grosskinsky, Otto-Alfred; and Fuchs, Hugo, 4,178,317, Cl. 585-357.000.
Fuji Photo Film Co., Ltd.: *See—*
Ohnishi, Masahiro, 4,178,471, Cl. 178-15.000.
Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, 4,178,185, Cl. 96-94.00R.
Fuji Photo Film Co., Ltd: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.
Fujii, Masayuki: *See—*
Sekiguchi, Tomoyoshi; and Fujii, Masayuki, 4,177,977, Cl. 267-64.00R.
Fujino, Takashi: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,178,445, Cl. 544-30.000.
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, to Hitachi, Ltd. Method for supporting hydrous metal oxide on carrier. 4,178,270, Cl. 252-447.000.
Fukawa, Kazumi, to Copal Company Limited. Cassette tape recorder. 4,178,616, Cl. 360-74.100.
Fukushima, Masakazu: *See—*
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, to Hitachi, Ltd. Electron guns for use in cathode ray tubes. 4,178,532, Cl. 313-414.000.
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., to Euteco S.p.A. Shipping container. 4,177,907, Cl. 220-1.500.
Funakubo, Hiroyasu; and Shiba, Masataka, to Funakubo, Hiroyasu. Voiced instruction identification system. 4,178,472, Cl. 179-1.0SD.
Fusco, Raffaello, to Anic S.p.A. Method for the purification of sewage waters which contain organic compounds of an anionic character. 4,178,242, Cl. 210-54.000.
Fuso Keigokin Co., Ltd.: *See—*
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.
Futaba Denshi Kogyo K.K.: *See—*
Kishino, Takao; and Kamagata, Toshio, 4,178,593, Cl. 340-753.000.
Futaba Sangyo Kabushiki Kaisha: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Gabriel, Gunter: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
GAF Corporation: *See—*
Chakrabarti, Paritosh M., 4,178,203, Cl. 162-156.000.
Chakrabarti, Paritosh M., 4,178,204, Cl. 162-156.000.
Chakrabarti, Paritosh M., 4,178,206, Cl. 162-156.000.
Lorenz, Donald H.; and Gruber, Bruce A., 4,178,303, Cl. 260-465.00D.
Schneider, Louis; and Graham, David E., 4,178,167, Cl. 71-95.000.
Schneider, Louis; and Graham, David E., 4,178,168, Cl. 71-95.000.
Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 4,178,378, Cl. 424-269.000.
Gailitis, Juris P.: *See—*
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Galli, Ralph, Jr. Water dispensing razor. 4,177,556, Cl. 30-41.000.
Gallinati, Albert A. Safety vest. 4,177,877, Cl. 182-3.000.
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Gamble, Robert L.: *See—*
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Gangl, William A. Shell box holding clip. 4,177,910, Cl. 224-252.000.
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Groskopf, Klaus, to Carl Zeiss-Stiftung. Hardened circular spectacle-lens element and method of making the same. 4,178,082, Cl. 351-159.000.
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Garrett Corporation, The: *See—*
Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., 4,177,713, Cl. 91-375.00R.
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Garvare, Tore; and Isaksson, Sven-Erik, to ASEA AB. Method of sealing hot isostatic containers. 4,178,178, Cl. 75-226.000.
Gaskill, George; and Horn, John, to Gould Inc. Load management apparatus. 4,178,572, Cl. 335-14.000.
Gates Rubber Company, The: *See*—
Russ, Paul E., Sr., 4,177,687, Cl. 74-231.00C.
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, to Snamprogetti, S.p.A. Air condenser. 4,177,859, Cl. 165-11.000.
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Gay, Derek J.: *See*—
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Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, to Dynamit Nobel Aktiengesellschaft. Modified polyesters. 4,178,277, Cl. 260-40.00R.
Gebhardt, James L.; and Sanders, Carlos L., to Mead Corporation, The. Indicating device. 4,177,588, Cl. 40-16.400.
Gebr. Happich GmbH: *See*—
Cziptschirsch, Kurt, 4,178,035, Cl. 296-97.00K.
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Gedzelman, Milton. Date reminder calendar. 4,178,019, Cl. 283-2.000.
Geisinger, Wolfgang. Apparatus for inserting a resilient band on a container. 4,177,546, Cl. 29-235.000.
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Berkowitz, Ami E.; and Lahut, Joseph A., 4,178,405, Cl. 428-215.000.
Bubar, Stanley F.; and Jennings, David L., 4,178,059, Cl. 339-115.00R.
Engeler, William E.; and Baertsch, Richard D., 4,178,519, Cl. 307-221.00D.
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Huseby, Irvin C.; and Klug, Frederic J., 4,178,187, Cl. 106-38.900.
Liebermann, Howard H., 4,177,856, Cl. 164-87.000.
MacLennan, Donald J.; and Morris, Edwin E., 4,178,522, Cl. 250-338.000.
Mailer, Werner H.; and Milliser, Charles E., 4,178,106, Cl. 400-57.000.
Ouellette, Maurice J., 4,178,482, Cl. 179-15.0AN.
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Irwin, John A., 4,177,692, Cl. 74-573.000.
Johnson, George S.; and Reff, Robey C., 4,177,551, Cl. 29-623.100.
Lura, Loren E., 4,178,028, Cl. 293-135.000.
Murphy, Michael P.; and Willis, Raymond D., 4,178,222, Cl. 204-195.00S.
Reid, Earl; and Copp, Carl A., Jr., 4,178,136, Cl. 417-269.000.
Ross, Phillip J., 4,177,885, Cl. 192-3.300.
Schluckebier, Floyd A., 4,177,714, Cl. 91-375.00A.
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000.
Sundeen, Arthur R., 4,177,785, Cl. 123-179.00H.
Geppert, Steven, to Eaton Corporation. Crane operating aid with operator interaction. 4,178,591, Cl. 340-685.000.
Gerber, Jerome J. Implement hitch assembly. 4,178,010, Cl. 280-412.000.
Gersbeck, Rolf, to Hermann Berstorff Maschinenbau GmbH. Method of and apparatus for rectifying distortion in an endless pressing band. 4,177,725, Cl. 100-38.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Merten, Gerhard, 4,178,040, Cl. 299-34.000.
Gill, Michael L.; and Hopkins, William M., to Goodyear Tire & Rubber Company, The. Foldable spare tire. 4,177,851, Cl. 152-353.00R.
Gillespie, James E.: *See*—
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Gittos, Maurice W.; and Letertre, Gerard J., to Merrell Toraude et Compagnie. Process for making 4-aminohex-5-enoic acid. 4,178,463, Cl. 562-574.000.
Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Products. Feeding turkeys. 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Products. Feeding pigs. 4,178,370, Cl. 424-177.000.
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, to BASF Aktiengesellschaft. Zinc electroplating bath. 4,178,217, Cl. 204-55.00Y.
Glasser, Michael. Combination key ring. 4,177,823, Cl. 131-184.00R.
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Glukhikh, Vasily A.: *See*—
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Gnaga, Vittorio. Device for automatic hair curling. 4,177,824, Cl. 132-34.00R.
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, to Kellogg Company. Method of making a ready-to-eat breakfast cereal. 4,178,392, Cl. 426-96.000.
Goetzinger, Gunther R.: *See*—
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., 4,177,727, Cl. 101-93.140.
Gomez, Magdalena U.: *See*—
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Gordon, Michael E.; and Stieger, Frank, to Polaroid Corporation. Method of making laminar batteries. 4,177,552, Cl. 29-623.400.
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Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, to Fried. Krupp Huttenwerke Aktiengesellschaft. Process for producing stainless steels. 4,178,173, Cl. 75-60.000.
Gorman, Paul D.: *See*—
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Gould Inc.: *See*—
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Schneider, Louis; and Graham, David E., 4,178,168, Cl. 71-95.000.
Grahmann, Helmut: *See*—
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Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, to Laboratories Made, S. A. 2,5-Dimethyl-benzo(b) thiene (3,2-f) morphan and precursor thereof. 4,178,450, Cl. 546-63.000.
Grangirard, Henri; and Serres, Pierre F., to Dubernard Hospital, S.A. Process and apparatus for the non-intrusive measurement of circulatory parameters. 4,177,801, Cl. 128-2.05M.
Grant, Louis A.: *See*—
Meyers, Leo J.; and Grant, Louis A., 4,177,975, Cl. 266-158.000.
Gras, Gilbert: *See*—
Leveque, Jean-Luc; and Gras, Gilbert, 4,177,798, Cl. 128-2.00S.
Grasso, Giuseppe: *See*—
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Green, Paul N.; and Duff, James A., to Magnetic Peripherals Inc. Disc memory module with stackable dust shield. 4,177,899, Cl. 206-509.000.

Greenberger, Alan J. Digital real time music synthesizer. 4,177,706, Cl. 84-1.010.

Greene, Bernard A.: *See—*
Stanley, John M.; and Greene, Bernard A., 4,178,001, Cl. 277-152.000.

Greenhalgh, Geoffrey, to Triplex Safety Glass Company Limited. Method of toughening glass sheets. 4,178,414, Cl. 428-410.000.

Greer, John G. Template for locating holes for faucet and basin in vanity-type sink counters. 4,177,569, Cl. 33-174.00G.

Gregersen, Jens A. H., to Aktieselskabet Grindstedvaerket. Method of preparing a monoglyceride dough additive. 4,178,393, Cl. 426-653.000.

Grell, Helmut; and Scharbach, Heinz, to Pfaudler-Werke A.G. Medical securement element with abrasive grains on thread surface. 4,177,524, Cl. 3-1.900.

Greneker, Lillian L. Finger fit implement. 4,177,698, Cl. 81-1.00R.

Griffin, Edward O. Panel carrier. 4,177,911, Cl. 224-45.00P.

Griffin, Teaford A. Knee pillow. 4,177,806, Cl. 128-132.00R.

Grossiord, Claude R.: *See—*
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Grosskinsky, Otto-Alfred: *See—*
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Grosskopf, Klaus: *See—*
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Grove, Leslie H. Rotary speed changer. 4,177,695, Cl. 74-80.400.

Grow, Harry N.; and Zboralski, Jon A., to American Hospital Supply Corporation. Baffle system for fume hood. 4,177,717, Cl. 98-115.0LH.

Grow, Harry N.; and Zboralski, Jon A., to American Hospital Supply Corporation. Fume hood. 4,177,718, Cl. 98-115.0LH.

Gruber, Bruce A.: *See—*
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Gruenewald, Manfred, to Excel Plastic Products, Inc. Extension cord holder. 4,177,961, Cl. 242-85.100.

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GTE Laboratories Incorporated: *See—*
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., 4,178,534, Cl. 315-39.000.

GTE Sylvania Incorporated: *See—*
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Decker, John J.; and Kantner, Donald J., 4,178,164, Cl. 65-59.00R.
Manners, David E., 4,178,536, Cl. 315-408.000.

Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., to S. T. Dupont. Liquefied gas apparatus. 4,177,646, Cl. 62-52.000.

Guddal, Erling, to Novo Industri A/S. p-Trimethylsilyloxyphenyl glycyloxy succinimide. 4,178,294, Cl. 260-326.400.

Guerrini, Giampaolo; and Bisone, Dario, to Ing. C. Olivetti & C., S.p.A. Typing device. 4,178,107, Cl. 400-144.200.

Guest, John D. Couplings for tubes. 4,178,023, Cl. 285-323.000.

Gunton, David J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Stripline coupler having comb electrode in coupling region. 4,178,568, Cl. 333-116.000.

H. H. Robertson Company: *See—*
Anderson, John W., 4,177,615, Cl. 52-478.000.
Fork, Frank W., 4,178,469, Cl. 174-48.000.

Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, to Ciba-Geigy Aktiengesellschaft. Cationically modified, cellulose-containing materials. 4,178,438, Cl. 536-30.000.

Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, to Schering, Aktiengesellschaft. C-homoestratrienes. 4,178,381, Cl. 424-283.000.

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Haines, Bernard M. Insolation survey device. 4,177,566, Cl. 33-1.0DD.

Hakert, Karl-Heinz; and Quitmann, Walter, to Mannesmann Aktiengesellschaft. Pressure roll for jacketing steel pipes with thermoplastic strip. 4,178,200, Cl. 156-187.000.

Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, to Enso-Gutzeit Osakeyhtio. Silo discharging means. 4,177,942, Cl. 222-198.000.

Hall, Gary Lester: *See—*
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Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., to Johnson & Johnson. Thermoplastic elastomeric film extrusion process. 4,178,337, Cl. 264-28.000.

Hall, Lester B., to Hall, Gary Lester. Pest control apparatus. 4,178,578, Cl. 367-139.000.

Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., to Dow Chemical Company, The. Ar-halo-ar(t-alkyl)styrenes and polymers thereof. 4,178,327, Cl. 525-169.000.

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Halliburton Company: *See—*
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Hamalainen, Matti J.: *See—*
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Hamamoto, Shoichi; and Hiwatashi, Masaaki, to Kyoto Ceramic Co., Ltd. Extrusion die for ceramic honeycomb structures. 4,178,145, Cl. 425-199.000.

Hamamoto, Takashi: *See—*
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Hammes, Theo; and Hoff, Alois, to Mauser Kommandit-Gesellschaft. Container and lid. 4,177,934, Cl. 220-319.000.

Hanneman, Rodney E., to General Electric Company. Welded austenitic steel pipe assembly. 4,178,022, Cl. 285-286.000.

Hansen, Elo H.: *See—*
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Hara, Michio: *See—*
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Harada, Nozomu: *See—*
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Harant, Gerhart W., to Repco Limited. Drive for balancing machines. 4,177,678, Cl. 73-460.000.

Harashima, Koh: *See—*
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Harding, Herbert D. Photographic processor. 4,178,088, Cl. 354-308.000.

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Harms, Robert R.: *See—*
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Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,177,730, Cl. 101-248.000.

Harris, Loyd F. Apparatus for processing low-grade aggregate ore. 4,178,238, Cl. 209-270.000.

Hart, David G.; and Venaas, Norman B., to Sangamo Weston, Inc. Motor driven reset mechanism for cumulative demand register. 4,177,922, Cl. 235-144.0MA.

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Hartness, Thomas P.; and Hartness, Robert G. Case indexing apparatus. 4,177,619, Cl. 53-250.000.

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Haskell, Lois O. Convertible purse. 4,177,909, Cl. 224-153.000.

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Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, to Nippon Soken, Inc. Deteriorated condition detecting apparatus for an oxygen sensor. 4,177,787, Cl. 123-198.00D.

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Hauni-Werke Korber & Co. KG.: *See—*
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Hausmann, George F., to United Technologies Corporation. Aerodynamic window. 4,178,078, Cl. 350-319.000.

Hawkins, Ronald G., to Aluminum Company of America. Boltless spacer device. 4,178,467, Cl. 174-40.00R.

Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, to Ono Pharmaceutical Co. Ltd. Prostaglandin I_2 analogues. 4,178,367, Cl. 424-285.000.

Hayashi, Torahiko. Stretcher of dough for cakes, bread and the like. 4,178,147, Cl. 425-372.000.

Hayashi, Yoshimasa: *See—*
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Hayes, John C.: *See—*
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Heasley, John M. Proximal box jig. 4,177,565, Cl. 433-75.000.

Heckle, William A.: *See—*
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Hector, Jean-Marie H.; and Pingaud, Bernard J., to Eastman Kodak Company. Acicular ferric oxide for magnetic recording and process for producing same. 4,178,416, Cl. 428-539.000.

Hegele, Rainer: *See—*
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Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.

Heinimann, Rene: *See—*
Roesch, Carol; and Heinimann, Rene, 4,178,492, Cl. 200-61.45R.

Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, to Hauni-Werke Korber & Co. KG. Method and apparatus for multiple testing of wrappers of cigarettes for porosity. 4,177,670, Cl. 73-38.000.

Heldor Associates, Inc.: *See—*
Arp, George F., 4,177,614, Cl. 52-247.000.

Heller, Fritz P., to Elliott Brothers (London) Limited. Head-up displays. 4,178,074, Cl. 350-171.000.

Helliwell, Bradley A.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.

Heltzel Company: *See—*
Brugler, Richard K., 4,178,117, Cl. 414-21.000.

Hendrix Wire & Cable Corp.: *See—*
Jean, Leonard P.; and Lachance, Ernest J., Sr., 4,178,470, Cl. 174-168.000.

Henn, John I., to Deere & Company. Hydrostatic front wheel drive system. 4,177,870, Cl. 180-243.000.

Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., to Zoecon Corporation. Isoindolinyl derivatives. 4,178,293, Cl. 260-326.100.

Henrick, Clive A.: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,178,296, Cl. 260-343.500.

Henry, Paul S., to Bell Telephone Laboratories, Incorporated. Linear amplification with nonlinear devices. 4,178,557, Cl. 330-10.000.

Hentschel, Karl-Heinz: *See—*
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Herbert Zippel Gmbh & Co. KG: *See—*
Zippel, Herbert, 4,178,048, Cl. 312-267.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Gersbeck, Rolf, 4,177,725, Cl. 100-38.000.

Herzig, Albert M. Air driven tool with double-ended aligned pistons oppositely driven. 4,177,712, Cl. 91-179.000.

Herzog, Klaus: *See—*
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl. 33-174.00L.

Hesston Corporation: *See—*
White, Allen A.; and Ankenman, Thomas W., 4,177,684, Cl. 74-212.000.

Hewitt, Allan R. Apparatus for gauging and pricing fasteners. 4,177,570, Cl. 33-174.00R.

Hewlett-Packard Company: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Rose, Donald K., 4,178,635, Cl. 365-19.000.

Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, to Westinghouse Electric Corp. Method for preparing dicalcium orthophosphate for use in fluorescent lamp phosphors. 4,178,355, Cl. 423-308.000.

Hickle, Jerry J.: *See—*
Kuss, Ralph L.; and Hickle, Jerry J., 4,177,844, Cl. 150-1.000.

Hickson, Donald A., to Chevron Research Company. Slush filtration method. 4,177,653, Cl. 62-534.000.

Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, to Nippon Kokan Kabushiki Kaisha. Molten slag runner for blast-furnace plant. 4,177,974, Cl. 266-196.000.

Higuchi, Takeru; and Lindenbaum, Siegfried, to Interx Research Corporation. Method for inducing rapid therapeutically effective antimalarial levels of certain selected conventional antimalarials. 4,178,376, Cl. 424-258.000.

Hikosaka, Takashi: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, 4,178,092, Cl. 355-3.00R.

Hildebrandt, Eckhard. Winding-in device for vehicle safety belts. 4,177,962, Cl. 242-107.40B.

Hill, Harry E., to R. T. Vanderbilt Company, Inc. Stabilized polyolefin composition. 4,178,280, Cl. 260-45.80A.

Hilti Aktiengesellschaft: *See—*
Entner, Josef, 4,177,867, Cl. 175-400.000.

Hindes, Ted E. Lighted sight pin for archery bows. 4,177,572, Cl. 33-265.000.

Hino, Minoru: *See—*
Yasui, Seimei; and Hino, Minoru, 4,178,186, Cl. 106-20.000.

Hirai, Seiji: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.

Hirai, Yutaka; Miyata, Katsuharu; Aiga, Makoto; and Hasegawa, Seiji, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing aromatic urethanes. 4,178,455, Cl. 560-24.000.

Hiraiwa, Kazuyoshi; and Takahashi, Kotei, to Nissan Motor Company, Limited. Parking brake mechanism for motor vehicle equipped with power transmission with torque converter. 4,177,886, Cl. 192-4.00A.

Hirayama, Takeshi: *See—*
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.

Hirota, Akira, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,178,606, Cl. 358-4.000.

Hitachi, Ltd.: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.
Iwamoto, Taro; and Ando, Shimon, 4,177,913, Cl. 228-9.000.
Nakamura, Michiharu; and Umeda, Junichi, 4,178,604, Cl. 357-18.000.
Nakaoka, Azuma; and Takahashi, Sankichi, 4,178,245, Cl. 210-81.000.
Nonaka, Yasuhiko, 4,178,196, Cl. 148-174.000.
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.
Shiraishi, Atsuko; and Shioya, Makoto, 4,178,132, Cl. 417-5.000.
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.
Yoshinari, Takashi; and Ookado, Terumi, 4,177,782, Cl. 123-148.00C.

Hiwatashi, Masaaki: *See—*
Hamamoto, Shoichi; and Hiwatashi, Masaaki, 4,178,145, Cl. 425-199.000.

Hlasnicek, Jean F.: *See—*
Hlasnicek, Richard S.; and Hlasnicek, Jean F., 4,177,985, Cl. 272-75.000.

Hlasnicek, Richard S.; and Hlasnicek, Jean F. Jump rope with variable weighting and rope configuration. 4,177,985, Cl. 272-75.000.

Ho, Roland K.: *See—*
Simonelic, Joseph J.; and Ho, Roland K., 4,178,621, Cl. 361-283.000.

Hobo, Nobuhito: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.

Hobson, Carroll D., to Goshen Rubber Co., Inc. O-Ring and apparatus and method of manufacture. 4,178,003, Cl. 277-237.00R.

Hoechst Aktiengesellschaft: *See—*
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.

Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, to Robert Bosch GmbH. Fuel injection pump. 4,177,775, Cl. 123-139.0AP.

Hoff, Alois: *See—*
Hammes, Theo; and Hoff, Alois, 4,177,934, Cl. 220-319.000.

Hoffman, Mark S., to Teradyne, Inc. Electrical measurement circuitry for low level AC signals. 4,178,544, Cl. 324-64.000.

Hoffman, Mark S.: *See—*
Wrinn, Joseph F.; and Hoffman, Mark S., 4,178,543, Cl. 324-64.000.

Hoffmann-La Roche Inc.: *See—*
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000.
Mondabaugh, Susan M.; and Gomez, Magdalena U., 4,178,359, Cl. 424-1.000.
Montavon, Marc; and Reiner, Roland, 4,178,443, Cl. 544-27.000.

Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., to General Motors Corporation. Carburetor and method of calibration. 4,178,332, Cl. 261-50.00R.

Holmberg, Lars-Erik. Apparatus for determining the alcoholic content in the blood. 4,177,668, Cl. 73-23.000.

Holst, Arno: *See—*
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.

Holt, Brian: *See—*
Lee, Peter I.; and Holt, Brian, 4,178,253, Cl. 252-47.000.

Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., to Hughes Aircraft Company. Scanning arrangements for optical frequency converters. 4,178,561, Cl. 350-6.600.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.

Hondo, Tadahiro: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Hone, Horace T., to United Technologies Corporation. Apparatus for synchronously elevating and lowering air-ambulance litter with crash attenuation capability. 4,178,032, Cl. 296-19.000.

Honeywell Inc.: *See—*
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.

Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., to Telec S.A. Enzymatic dentifrices. 4,178,362, Cl. 424-48.000.
Hooker Chemicals & Plastics Corp.: *See—*
Ruthel, Walter W.; and Evans, Leo G., 4,178,225, Cl. 204-279.000.
Hoover, Charles D., to AMP Incorporated. Fiber optic cable termination means. 4,178,068, Cl. 350-96.210.
Hoover Company, The: *See—*
Powers, Joseph A., 4,177,536, Cl. 15-182.000.
Hopkins, William M.: *See—*
Gill, Michael L.; and Hopkins, William M., 4,177,851, Cl. 152-353.00R.
Horgan, John J., to United Technologies Corporation. Centrifugal fluidized bed combustor. 4,177,636, Cl. 60-39.350.
Horibe, Susumu: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,178,445, Cl. 544-30.000.
Horike, Masanori: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.
Horn, John: *See—*
Gaskill, George; and Horn, John, 4,178,572, Cl. 335-14.000.
Horn, Peter; Grosskinsky, Otto-Alfred; and Fuchs, Hugo, to BASF Aktiengesellschaft. Manufacture of olefinically unsaturated aliphatic or cycloaliphatic hydrocarbons. 4,178,317, Cl. 585-357.000.
Horn, William E., Jr., to Borg-Warner Corporation. Flame-retardant polycarbonate compositions. 4,178,281, Cl. 260-45.80R.
Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG: *See—*
Zerhoch, Horst, 4,177,663, Cl. 72-165.000.
Hosoi, Kameo: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.
Hotta, Toshihiro; and Makino, Takao, to Kabushiki Kaisha Morita Seisakusho. Device for controlling amount of X-ray irradiation. 4,178,508, Cl. 250-355.000.
Hounsfield, Godfrey N.; and Waltham, Richard M., to E M I Limited. Radiography. 4,178,511, Cl. 250-445.00T.
Hovel, Harold J.; and Woodall, Jerry M., to International Business Machines Corporation. Semiconductor structure. 4,178,195, Cl. 148-171.000.
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., to Dayco Corporation. Endless power transmission belt and method for making same. 4,177,688, Cl. 74-233.000.
Hoyer, Gerhard: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.
Hsieh, Henry L.; and Naylor, Floyd E., to Phillips Petroleum Company. Block copolymers of dienes and hydrocarbyl-substituted styrenes as adhesives. 4,178,275, Cl. 260-33.60A.
Hsu, Sheng T.; and Cartwright, James M., Jr., to RCA Corporation. Complementary MOS inverter structure. 4,178,605, Cl. 357-42.000.
Hubbard, Winchester L.: *See—*
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000.
Huber, Eugen W., deceased: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.
Huber-Patzold, Gerda A. O., Anke H. L. Huber, Christina G. E. Huber, heirs: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.
Hubner, Kurt: *See—*
Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, 4,177,632, Cl. 58-23.0BA.
Huestis, Allan C., to Midrex Corporation. Apparatus for monitoring the feeding of particulate materials to a packed bed furnace. 4,178,151, Cl. 432-1.000.
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, to Agence Nationale de Valorisation de la Recherche (ANVAR). System for generating a high-energy electrical signal through a brief time, and a laser comprising such a system. 4,178,563, Cl. 331-94.5PE.
Huggins, Homer D.: *See—*
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., 4,177,861, Cl. 165-101.000.
Hughes Aircraft Company: *See—*
Bilow, Norman, 4,178,430, Cl. 528-245.000.
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.
Hujsak, Edward J.; and Siden, LeRoy E., to General Dynamics Corporation. Docking system for space structures. 4,177,964, Cl. 244-161.000.
Hulls, Leonard R.; and Dowdell, Toy, Jr., to RCA Corporation. Alternator test apparatus and method. 4,178,546, Cl. 324-158.0MG.
Humphrey, Robert J., to Avco Corporation. Gift wrap package. 4,177,898, Cl. 206-494.000.
Hunt, Susan L.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
Hunter, Edwin J., to Toro Company, The. Water accumulator-distributor for agricultural sprinkler. 4,177,926, Cl. 239-99.000.
Hunter, Gary L.: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Husbands, David R.: *See—*
Ayers, John S.; and Husbands, David R., 4,178,439, Cl. 536-59.000.
Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Mixed oxide compound $NdAlO_3$ for casting advanced superalloy materials. 4,178,187, Cl. 106-38.900.
Huston, Ernest L.: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.
Huxtable, Jonathan: *See—*
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.
Hymatic Engineering Company Limited, The: *See—*
Campbell, David N., 4,177,650, Cl. 62-222.000.
Hyytinen, Niilo M., to A B C Concrete Products. Method and apparatus for making concrete brick having antique appearance. 4,178,340, Cl. 264-73.000.
Iacotti, Italo; and Pasero, Edoardo, to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A. Process for the production of carburized sponge iron briquettes. 4,178,170, Cl. 75-3.000.
Ibaragi, Tetsuo: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for sensing air-pressure drop in a tire. 4,177,671, Cl. 73-146.500.
Ichimura, Masaaki: *See—*
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.
Idemura, Hideo: *See—*
Asanagi, Etsuo; and Idemura, Hideo, 4,178,348, Cl. 423-242.000.
Igoe, Robert S., to Merck & Co., Inc. Compositions for stabilizing soft serve and hard frozen yogurt. 4,178,390, Cl. 426-43.000.
Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera containing a movable automatic dimmer strobo. 4.178,083, Cl. 354-41.000.
Iikura, Masakazu: *See—*
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.
Ikegawa, Kiyohiro: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.
Iles, Frank. Cartridge for peristaltic pump. 4,178,138, Cl. 417-360.000.
Illgner, Eberhard, to Magirus-Deutz AG. Device for adjusting and coupling amphibious vehicles. 4,177,531, Cl. 14-27.000.
Imaizumi, Koji: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, 4,178,092, Cl. 355-3.00R.
Imatoku, Yoshinobu: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Imperial Chemical Industries Limited: *See—*
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.
Snowden, Paul, 4,178,336, Cl. 264-8.000.
Steele, Daniel, 4,177,732, Cl. 102-27.00R.
Impulsphysik GmbH: *See—*
Frungel, Frank; and Gelbke, Eberhard, 4,178,512, Cl. 250-461.00R.
Inaba, Masao: *See—*
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Inductive Controls Limited: *See—*
Logan, Robert J., 4,178,540, Cl. 323-89.00R.
Ing. C. Olivetti & C., S.p.A.: *See—*
Guerrini, Giampaolo; and Bisone, Dario, 4,178,107, Cl. 400-144.200.
Innerspace Corporation: *See—*
Gongwer, Calvin A., 4,178,128, Cl. 416-72.000.
Inouye, Kinichi: *See—*
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Institut fur Motorenbau Professor Huber Eingetragener Verein: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.
Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N S.E.R.M.: *See—*
Bout, Daniel, 4,178,365, Cl. 424-88.000.
Institut Pasteur: *See—*
Bout, Daniel, 4,178,365, Cl. 424-88.000.
Institut Straumann AG: *See—*
Wenger, Alfred, 4,177,669, Cl. 73-32.00A.
Intengan, Franklin S. Racquet display case. 4,177,845, Cl. 150-52.00G.
Intercraft Industries Corporation: *See—*
Tushner, Lawrence P.; and Krol, Walter J., 4,177,590, Cl. 40-156.000.
International Blind Company: *See—*
Anderson, Samuel J.; and Anderson, James M., 4,177,853, Cl. 160-168.00R.
International Business Development Co.: *See—*
Zenzaburo, Iwamoto, 4,177,790, Cl. 126-38.000.
International Business Machines Corporation: *See—*
Allen, George W.; and Felton, Bruce C., 4,178,629, Cl. 363-96.000.
Argyle, Bernell E.; Slonczewski, John C.; and Dekker, Pieter, 4,178,636, Cl. 365-30.000.

Champion, James R.; and Seigal, Steven D., 4,178,095, Cl. 355-14.00R.
Hovel, Harold J.; and Woodall, Jerry M., 4,178,195, Cl. 148-171.000.
Kane, Milburn H., 4,178,108, Cl. 400-144.200.
Marinace, John C., 4,178,197, Cl. 148-175.000.
International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; and Theimer, Ernst T., 4,178,311, Cl. 260-592.000.
International Harvester Company: *See—*
Cicci, George B., 4,177,627, Cl. 56-15.800.
International Nickel Company, Inc., The: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.
International Paper Company: *See—*
Ford, Mack L., Jr.; and McFarland, William W., 4,177,936, Cl. 220-441.000.
International Research and Development Corporation: *See—*
Leong, Basil K. J., 4,177,941, Cl. 222-636.000.
International Standard Electric Corporation: *See—*
Reutter, Jorg; and Dietze, Wolfgang, 4,178,569, Cl. 333-119.000.
International Telephone and Telegraph Corporation: *See—*
Speth, William R., 4,178,521, Cl. 307-270.000.
Interx Research Corporation: *See—*
Higuchi, Takeru; and Lindenbaum, Siegfried, 4,178,376, Cl. 424-258.000.
Iowa State University Research Foundation, Inc.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Irwin, John A., to General Motors Corporation. Shaft balancing. 4,177,692, Cl. 74-573.000.
Isa, Isao: *See—*
Shibuya, Morioki; and Isa, Isao, 4,178,356, Cl. 423-478.000.
Isaksson, Sven-Erik: *See—*
Garvare, Tore; and Isaksson, Sven-Erik, 4,178,178, Cl. 75-226.000.
Isayama, Takuro; and Komai, Hiromichi, to Ricoh Company, Ltd. Color ink jet printing apparatus. 4,178,597, Cl. 346-75.000.
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, to Nissan Motor Company, Limited. Safety bag inflation apparatus with extendible guard member against contact of bag with heated gas generator. 4,178,017, Cl. 280-740.000.
Ishigaki Kiko Co., Ltd.: *See—*
Iwatani, Akitoshi, 4,178,251, Cl. 210-350.000.
Ishigaki, Yuzo: *See—*
Ogita, Minoru; and Ishigaki, Yuzo, 4,178,551, Cl. 325-427.000.
Ishikawa, Seiji: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.
Ishikawa, Shinzo: *See—*
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.
Ishikawa, Tomihisa: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.
Ishikawa, Youichi: *See—*
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.
Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A.: *See—*
Iacotti, Italo; and Pasero, Edoardo, 4,178,170, Cl. 75-3.000.
ITI Limited: *See—*
Mougin, Georges L., 4,177,748, Cl. 115-76.000.
Ito, Haruo: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.
Ito, Hiroyuki: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.
Ito, Osamu: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Ito, Tadashi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.
Ito, Takamichi: *See—*
Narita, Kiichi; Mori, Takasuke; and Ito, Takamichi, 4,178,175, Cl. 75-93.00E.
Itoh, Hiroshi: *See—*
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Brake mechanism for tractors. 4,178,044, Cl. 303-47.000.
Itou, Masami: *See—*
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.
Ivaldi, Raoul: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.
Ivanko, Theodore; and Saboe, Michael S., to Avco Corporation. Drive system. 4,177,693, Cl. 74-661.000.
Iwamoto, Taro; and Ando, Shimon, to Hitachi, Ltd. Automatic pipe welding apparatus. 4,177,913, Cl. 228-9.000.
Iwasaki, Kyuhachiro: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.
Iwatani, Akitoshi, to Ishigaki Kiko Co., Ltd. Apparatus for dehydration of sludge. 4,178,251, Cl. 210-350.000.
Jacob, Richard J., to Dayco Corporation. Endless power transmission belt. 4,177,686, Cl. 74-231.0CB.
Jaeneke, Christian: *See—*
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, 4,177,733, Cl. 102-93.000.
Jakobsson, Sixten: *See—*
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.
Jakusch, Helmut: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.
James D. Easton, Inc.: *See—*
Easton, James L.; and Filice, Gary W., 4,177,989, Cl. 273-72.00A.
James, David R. Sanitary chairs. 4,177,528, Cl. 4-134.000.
James, Rex L.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
James, William L.; and Wonso, Alex P., to Fennell Corporation. Apparatus for obtaining bright finish galvanizing coating on wire. 4,177,754, Cl. 118-47.000.
Jamieson, Geoffrey A.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,178,256, Cl. 252-8.750.
Jamison, Fred W. Security lock system. 4,178,587, Cl. 340-542.000.
Jan-Bar Retrieval Corporation: *See—*
Janson, John J., 4,178,247, Cl. 210-96.100.
Janson, John J., to Jan-Bar Retrieval Corporation. Oil spill retrieval system. 4,178,247, Cl. 210-96.100.
Japan Carlit Co., Ltd., The: *See—*
Shibuya, Morioki; and Isa, Isao, 4,178,356, Cl. 423-478.000.
Japan Steel Works, Ltd., The: *See—*
Oda, Toyohisa; and Inouye, Kinichi, 4,178,417, Cl. 428-679.000.
Jean, Leonard P.; and Lachance, Ernest J., Sr., to Hendrix Wire & Cable Corp. Insulator for electrical conductors and method of stringing such conductors on insulators. 4,178,470, Cl. 174-168.000.
Jeavons, Philip S.; and Fisher, Sidney E., to Wilmot-Breeden Limited. Regulator assemblies. 4,177,606, Cl. 49-351.000.
Jeffries, Dennis L.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Jenkinson, John, to Rolls-Royce Limited. Gas turbine engine cooling system. 4,178,129, Cl. 416-95.000.
Jennings, David L.: *See—*
Bubar, Stanley F.; and Jennings, David L., 4,178,059, Cl. 339-115.00R.
Jensen, John A.: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.
Jensen, Knud B.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Morton, Richard G., 4,178,565, Cl. 331-94.50D.
Jespersen, Emil; and Mogensen, Vagn, to Dansk Industri Syndikat AS. Conveyor comprising a driven flexible belt for stepwise advancing moulds. 4,177,892, Cl. 198-832.000.
Jessel, Maurice J.: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Company, Ltd. Ink jet printing apparatus with ink replenishing. 4,178,595, Cl. 346-140.00R.
Joel, Amos E., Jr., to Bell Telephone Laboratories, Incorporated. Signaling system. 4,178,474, Cl. 179-1.50R.
Johannes Fuchs, Firma: *See—*
Dolinsek, Hans, 4,178,030, Cl. 294-70.000.
John F. Lontz Associates, Inc.: *See—*
Lontz, John F., 4,178,096, Cl. 355-32.000.
John Thomas Batts, Inc: *See—*
Batts, John H.; and Garrison, Judd F., 4,177,908, Cl. 223-96.000.
Johns-Manville Corporation: *See—*
Reynolds, Harold J., Jr., 4,178,278, Cl. 260-42.220.
Johnson Controls, Inc.: *See—*
Matthews, Russell B., 4,178,149, Cl. 431-46.000.
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., to Keystone Consolidated Industries, Inc. Strap tensioning device. 4,177,724, Cl. 100-26.000.
Johnson, George S.; and Reff, Robey C., to General Motors Corporation. Method of welding a arc battery intercell connector. 4,177,551, Cl. 29-623.100.

Johnson, James A.; and Touma, Raouf G., to UOP Inc. Process for the simultaneous production of aromatic hydrocarbons and isobutane. 4,178,230, Cl. 208-66.000.

Johnson & Johnson: *See—*
Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., 4,178,337, Cl. 264-28.000.

Johnson, Richard A., to Sanders Associates, Inc. Period-modulated voltage controlled oscillator. 4,178,567, Cl. 331-177.00R.

Johnson, Richard E. Furniture dolly. 4,178,006, Cl. 280-79.10A.

Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., to AMP Incorporated. Splicing optic waveguides by shrinkable means. 4,178,067, Cl. 350-96.210.

Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., to Honeywell Inc. Heating and cooling thermostat with changeover switching operated upon control point adjustment. 4,177,860, Cl. 165-26.000.

Johnson, William R., to Chinook Manufacturing Co. Freestanding fireplace stove with heated air circulation. 4,177,793, Cl. 121-121.000.

Johnstone, Richard: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.

Jolley, Kenneth A. Fishing lure hook up swivel. 4,177,598, Cl. 43-42.490.

Jordan, John F.; and Singh, Vijay P., to Photon Power, Inc. Methods for improving solar cell open circuit voltage. 4,178,395, Cl. 427-74.000.

Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., to Square D Company. Duct post. 4,178,468, Cl. 174-48.000.

Joseloff, Stanley. Combination supermarket counter and cart therefor. 4,177,880, Cl. 186-1.00R.

Joyner, Frederick B.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R.

Jung, Lothar. Apparatus for manufacturing hollow and solid ingots. 4,178,165, Cl. 65-144.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Kawashima, Hirofumi, 4,178,527, Cl. 310-370.000.
Kawashima, Hirofumi, 4,178,566, Cl. 331-156.000.
Miyamoto, Masao, 4,177,633, Cl. 58-23.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.
Okada, Masaru; and Kanai, Seikichi, 4,177,769, Cl. 123-30.00D.

Kabushiki Kaisha Morita Seisakusho: *See—*
Hotta, Toshihiro; and Makino, Takao, 4,178,508, Cl. 250-355.000.
Yada, Akio; and Tsukada, Naonobu, 4,178,038, Cl. 297-391.000.

Kabushiki Kaisha Sango: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Yamada, Haruyoshi; and Ushikoshi, Kenichi, 4,177,631, Cl. 58-23.0BA.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Shinoda, Akibumi; and Shimizu, Masahiko, 4,178,004, Cl. 280-5.00A.

Kadex, Inc.: *See—*
Aydin, Kemal, 4,177,657, Cl. 70-278.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Crawford, Millard B., 4,177,825, Cl. 137-243.200.

Kajimoto, Noboru: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Kajiwara, Takao, to Nippon Gakki Seizo Kabushiki Kaisha. Racket frame. 4,177,990, Cl. 273-73.00C.

Kakiuchi, Akio: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Kalinkin, Damir A.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kalitz, Milton C., to American Sunroof Corporation. Positive lock mechanism for vehicular sliding roof panels. 4,178,036, Cl. 296-137.00B.

Kalninsh, Arvid Y.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kamagata, Toshio: *See—*
Kishino, Takao; and Kamagata, Toshio, 4,178,593, Cl. 340-753.000.

Kameswaran, Venkataraman: *See—*
Berkelhammer, Gerald; and Kameswaran, Venkataraman, 4,178,460, Cl. 562-426.000.

Kampe, Marcis M.: *See—*
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Kanai, Seikichi: *See—*
Okada, Masaru; and Kanai, Seikichi, 4,177,769, Cl. 123-30.00D.

Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G. Thin film cryotron. 4,178,602, Cl. 357-4.000.

Kane, Milburn H., to International Business Machines Corporation. Apparatus for space synchronizing carrier and rotatable print disk positions in on-the-fly printing. 4,178,108, Cl. 400-144.200.

Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, to Ube Industries, Ltd. Aromatic copolyamide fiber from benzidine sulfone or diamino phenanthridone. 4,178,431, Cl. 528-337.000.

Kanesa Miso Kabushiki-Kaisha: *See—*
Kobayashi, Masakazu; and Harashima, Koh, 4,177,574, Cl. 34-12.000.

Kanter, Jerome J. Method of improving corrosion resistance with coating by friction. 4,178,193, Cl. 148-6.000.

Kantner, Donald J.: *See—*
Decker, John J.; and Kantner, Donald J., 4,178,164, Cl. 65-59.00R.

Kao Soap Co., Ltd: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.

Kao, Stephen S. T.: *See—*
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., 4,177,861, Cl. 165-101.000.

Kappenhagen, George A., to Westinghouse Electric Corp. Elevator system. 4,177,881, Cl. 187-56.000.

Kappler, Fritz Robert: *See—*
Englaender, Fritz; and Kappler, Fritz Robert, 4,178,295, Cl. 260-343.30R.

Kasamura, Toshirou: *See—*
Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, 4,177,757, Cl. 118-658.000.

Katayama, Masato: *See—*
Marumo, Shingo; and Katayama, Masato, 4,178,462, Cl. 562-501.000.

Kato, Masayoshi: *See—*
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,178,017, Cl. 280-740.000.

Kato, Tetsuo: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.

Katoh, Kazuo: *See—*
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.

Katsura, Toshio: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Kaufer, Wilhelm: *See—*
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.

Kawada, Shin: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Kabushiki Kaisha. Ignition system for internal combustion engines. 4,177,776, Cl. 123-117.00A.

Kawam, Antoine: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.

Kawasaki Steel Corporation: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Quartz crystal tuning fork vibrator with unexcited tine centers for reduced flexural amplitudes. 4,178,527, Cl. 310-370.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Quartz crystal tuning fork vibrator for a crystal oscillator. 4,178,566, Cl. 331-156.000.

Kayser, Ernst, to Carl Freudenberg, Firma. Separating piston for hydropneumatic one-tube vibration damper. 4,178,002, Cl. 277-212.000.

Kearney & Trecker Corporation: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.

Keller, Douglas V., Jr.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,233, Cl. 209-3.000.

Kellett, Harry; and Searle, Harold L., to Vickers Limited. Reverse self-locking device. 4,177,887, Cl. 192-8.00R.

Kellogg Company: *See—*
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, 4,178,392, Cl. 426-96.000.

Kelly, Robert C., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,178,440, Cl. 542-426.000.

Kelly, Robert C., to Upjohn Company, The. Enlarged-hetero-ring prostacylin analogs. 4,178,441, Cl. 542-426.000.

Kelly, William T., III, to Union Carbide Corporation. Rechargeable cell checker. 4,178,538, Cl. 320-2.000.

Kelpin, Thomas G. Aquatic plant sampler. 4,177,624, Cl. 56-9.000.

Kendall Company, The: *See—*
Patel, Bhupendra C., 4,177,815, Cl. 128-349.00B.

Kennametal Inc.: *See*—
Fawcett, William E., 4,177,956, Cl. 241-188.00A.
Kennedy, Andrew J., to United States of America, Army. Image intensifier unitube for intensified charge transfer device and method of manufacture. 4,178,528, Cl. 313-102.000.
Kennedy , Andrew J., to United States of America, Army. Flip-header and tube base for CTD mounting within an image intensifier. 4,178,529, Cl. 313-102.000.
Kennedy, Harry R., to Seabrook, Inc. Tunable noise suppression system for spinning machine fiber collector units. 4,177,629, Cl. 57-1.00R.
Kent, Frank N., Jr., to Austin Industries, Inc. Wheel mounting assembly. 4,178,005, Cl. 280-43.180.
Kent, Jan H. F., to Kentredder Limited. Method and apparatus for treading tires. 4,178,198, Cl. 156-96.000.
Kentredder Limited: *See*—
Kent, Jan H. F., 4,178,198, Cl. 156-96.000.
Keresztes, Stephan L.: *See*—
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.
Key, Paul F.: *See*—
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
Keystone Consolidated Industries, Inc.: *See*—
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,177,724, Cl. 100-26.000.
Khalid, Joseph M., to Square D Company. Current limiting circuit breaker. 4,178,618, Cl. 361-58.000.
Khartli, Inc.: *See*—
Rush, Kim E., 4,178,041, Cl. 301-5.0BA.
Khomyakov, Alexandr M.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Manufacture of halogen cycle incandescent lamps. 4,178,050, Cl. 316-19.000.
Kikuchi Kogyo K. K.: *See*—
Kikuchi, Kouichi, 4,177,839, Cl. 139-419.000.
Kikuchi, Kouichi, to NSK-Warner K.K.; and Kikuchi Kogyo K. K. Webbing for seat belt. 4,177,839, Cl. 139-419.000.
Kilpelainen, Ossi: *See*—
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.
Kim, Bong K.: *See*—
Kim, Chin K., 4,177,594, Cl. 43-15.000.
Kim, Chin K., to Kim, Bong K., a part interest. Fishing rod attachment. 4,177,594, Cl. 43-15.000.
Kimes, Richard C.: *See*—
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., 4,178,209, Cl. 195-1.800.
Kinard, Gerald W., to Certain-teed Corporation. Automatic bag opener. 4,177,726, Cl. 100-214.000.
King, John M., to Chevron Research Company. Dispersant Mannich base compositions. 4,178,259, Cl. 252-42.700.
King, Olin B., to SCI Systems, Inc. Rotary printing method. 4,178,583, Cl. 346-163.000.
King, Olin B., to SCI Systems, Inc. Mounting structure for rotary electrical stylus device. 4,178,599, Cl. 346-163.000.
King, Olin B., to SCI Systems, Inc. Record feed means for rotary electrical stylus device. 4,178,600, Cl. 346-163.000.
King, Olin B., to SCI Systems, Inc. Record drive means for rotary electrical stylus device. 4,178,601, Cl. 346-163.000.
Kinsley, John P., to Continental Group, Inc., The. Mold having cutter means. 4,178,146, Cl. 425-289.000.
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, to Sumitomo Metal Industries Limited; and Sumikin Coke Company Limited. Method of manufacturing blast furnace coke. 4,178,215, Cl. 201-6.000.
Kirsch, John G. Tapered fit coupling method and apparatus. 4,178,011, Cl. 280-477.000.
Kishino, Takao; and Kamagata, Toshio, to Futaba Denshi Kogyo K.K. Driving circuit for a luminescent display tube for analog display. 4,178,593, Cl. 340-753.000.
Kitayama, Yoshiko: *See*—
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.
Klapproth, Friedrich, deceased; and by Klapproth, Maria Elisabeth, executrix. Cylinder blanket for offset printing presses. 4,178,402, Cl. 428-192.000.
Klapproth, Maria Elisabeth, executrix: *See*—
Klapproth, Friedrich, deceased; and Klapproth, Maria Elisabeth, executrix, 4,178,402, Cl. 428-192.000.
Klebe, Hans; and Knippschild, Gerd, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the stabilization of sodium percarbonate. 4,178,351, Cl. 423-275.000.
Klein, Darrell L.: *See*—
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.
Klein, Gerald B. Injection molding method for the manufacture of a snelled fishhook. 4,178,342, Cl. 264-275.000.
Klein, Max. Separator for discrete solids from liquids. 4,178,246, Cl. 210-82.000.
Klein, Robert W.; and Foxx, Mary E., to William H. Rorer, Inc. Coal tar gel composition. 4,178,373, Cl. 424-233.000.
Klein, Theodore H., to Bell Telephone Laboratories, Incorporated. Reinforced flexible printed wiring board. 4,177,553, Cl. 29-625.000.
Kleist, Robert A.; and Matula, Jerry, to Printronix, Inc. Printer system ribbon drive having constant ribbon speed and tension. 4,177,731, Cl. 101-336.000.
Kley, Victor B. Electrical data entry devices. 4,178,481, Cl. 178-18.000.
KLI, Incorporated: *See*—
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.
Klimazewski, Leo T., to ACF Industries, Incorporated. Diverter valve for exhaust system of internal combustion engine. 4,177,642, Cl. 60-290.000.
Klimezky, Frank. Swivel link for a dual chain conveyor. 4,177,635, Cl. 59-78.000.
Klinkenberg, Herbert: *See*—
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.
Klinkenberg, Hubert E., to Beaver Precision Products, Inc. Ball screw and nut. 4,177,690, Cl. 74-424.80R.
Klug, Frederic J.: *See*—
Huseby, Irvin C.; and Klug, Frederic J., 4,178,187, Cl. 106-38.900.
Kluthe, Eldon R. Grain scalping and cleaning apparatus and method. 4,177,900, Cl. 209-247.000.
Kneifel, Jerome J., to Dale Electronics, Inc. Electrical resistor testing fixture. 4,178,545, Cl. 324-158.00F.
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., to KLI, Incorporated. Self-sealing cannula. 4,177,814, Cl. 128-348.000.
Knight, Andrew C.; and Meek, Nigel W., to Sperry Rand Corporation. Pull-type agricultural machine. 4,177,625, Cl. 56-13.600.
Knight, William M., Jr.: *See*—
Dudley, Dana; and Knight, William M., Jr., 4,178,612, Cl. 358-167.000.
Knippschild, Gerd: *See*—
Klebe, Hans; and Knippschild, Gerd, 4,178,351, Cl. 423-275.000.
Knoll, Heinz W.: *See*—
Andres, Rudolf; and Knoll, Heinz W., 4,178,016, Cl. 280-734.000.
Knox, Lloyd C., to Halliburton Company. Plat-gard leg closure. 4,178,112, Cl. 405-227.000.
Knudsen, Poul U.: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.
Kobayashi, Masakazu; and Harashima, Koh, to Kanesa Miso Kabushiki-Kaisha. Method and apparatus for granulating hydrated materials including food stuffs. 4,177,574, Cl. 34-12.000.
Kobe Steel, Ltd · *See*—
Narita, Kiic ..; Mori, Takasuke; and Ito, Takamichi, 4,178,175, Cl. 75-93.00E.
Kocher, Timothy L.; and Bennett, Benny M., to AMP Incorporated. Latch/eject pin header. 4,178,051, Cl. 339-45.00M.
Kodama, Yutaka: *See*—
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.
Koehler, Horst: *See*—
Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, 4,177,661, Cl. 72-128.000.
Koester, Eberhard: *See*—
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.
Kofsky, Harvey I.; and Levine, Arthur. Muscle stimulating apparatus. 4,177,819, Cl. 128-422.000.
Kohler, Jurgen: *See*—
Schiek, Burkhard; and Kohler, Jurgen, 4,178,570, Cl. 333-161.000.
Kohsaka, Masanobu: *See*—
Demain, Arnold L.; and Kohsaka, Masanobu, 4,178,210, Cl. 195-29.000.
Kojima, Tadashi: *See*—
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.
Kolesnikov, Dmitry P.: *See*—
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.
Komai, Hiromichi: *See*—
Isayama, Takuro; and Komai, Hiromichi, 4,178,597, Cl. 346-75.000.
Komar, Alexandr E., administrator: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Komar, Evgeny G., deceased: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov,

Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Komar, Olga E., administrator: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Komarovskikh, Nina I.: *See*—
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Konishi, Yoshitaka: *See*—
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Yaichi, 4,178,083, Cl. 354-41.000.
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,178,184, Cl. 96-74.000.

Konkler, Anthony W.: *See*—
Weavers, Mark W.; and Konkler, Anthony W., 4,177,896, Cl. 206-387.000.

Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.

Korb, Robert W.: *See*—
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.

Koreska, Peter, to W. Koreska GmbH. Method for producing duplicating stencils. 4,177,728, Cl. 101-128.200.

Kornfeld, William F. Merchandise container. 4,177,893, Cl. 206-45.140.

Kornylak Corporation: *See*—
Tabler, Charles P., 4,178,144, Cl. 425-150.000.

Korpman, Ralf: *See*—
Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., 4,178,337, Cl. 264-28.000.

Kovar, Jan; and Drkal, Jan, to Vyzkumny ustav tvarecich stroju a technologie tvareni. Apparatus for feeding workpieces for cross wedge rolling. 4,177,660, Cl. 72-108.000.

Koyama, Aiichiro: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.

Kramer, Michael J.: *See*—
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000.

Krastinsh, Valter P.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kraus, Peter: *See*—
Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, 4,178,383, Cl. 424-304.000.

Krautz, Fred G.: *See*—
Sage, Donald B.; and Krautz, Fred G., 4,178,412, Cl. 428-391.000.

Krebs, Gary A.: *See*—
Farkas, Kalman; and Krebs, Gary A., 4,177,610, Cl. 51-241.00S.

Krenitsky, Thomas A.; and Bushby, Stanley R. M., to Burroughs Wellcome Co. Stabilized thymidine phosphorylase formulation. 4,178,212, Cl. 195-63.000.

Kressel, Henry: *See*—
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.

Krol, Johannes W. A.: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000.

Krol, Walter J.: *See*—
Tushner, Lawrence P.; and Krol, Walter J., 4,177,590, Cl. 40-156.000.

Krone, Ray B. Device for separating particles from a fluid suspension and method for so doing. 4,178,252, Cl. 210-521.000.

Krueger, Rudolph E. Anemometer. 4,177,673, Cl. 73-189.000.

Krump, Robert C., to Emerson Electric Co. Battery operated thermostat timer with battery charging circuits. 4,177,923, Cl. 236-46.00R.

Krutenat, Robert A. Method for the disposal of nuclear or toxic waste materials. 4,178,109, Cl. 405-128.000.

Kubota, Nobuhisa: *See*—
Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, 4,178,396, Cl. 427-93.000.

Kugelmann, Adolf: *See*—
Seiler, Hartmut; and Kugelmann, Adolf, 4,178,619, Cl. 361-91.000.

Kulieva, Khalida Y. K.: *See*—
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.

Kumar, Surinder, to Quaker Oats Company, The. Process for producing sausage analogs. 4,178,394, Cl. 426-656.000.

Kunisawa, Masuo: *See*—
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.

Kunst, Helmut; and Wahl, Georg, to Deutsche Gold- und Silber Scheideanstalt vormals Roessler. Process for removal of hardening and galvanizing waste water. 4,178,244, Cl. 210-71.000.

Kuppinger, Charlotte W., executrix: *See*—
Kuppinger, John C., deceased; and Kuppinger, Charlotte W., executrix, 4,177,526, Cl. 3-13.000.

Kuppinger, John C., deceased; and by Kuppinger, Charlotte W., executrix. Securing device for an intraocular lens. 4,177,526, Cl. 3-13.000.

Kurimoto Iron Works, Ltd.: *See*—
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha; Kabushiki Kaisha Sango; and Futaba Sangyo Kabushiki Kaisha. Muffler for internal combustion engine. 4,177,875, Cl. 181-265.000.

Kuroda, Hiroshi; Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Internal combustion engine system. 4,177,640, Cl. 60-274.000.

Kushmaul, Thomas R.: *See*—
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000.

Kuss Corporation: *See*—
Kuss, Ralph L.; and Hickle, Jerry J., 4,177,844, Cl. 150-1.000.

Kuss, Ralph L.; and Hickle, Jerry J., to Kuss Corporation. Silo breather bag. 4,177,844, Cl. 150-1.000.

Kuttner, Gottfried, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Sealing provided between the walls of a cooled continuous mould and the head of a starter bar. 4,178,000, Cl. 277-138.000.

Kyoto Ceramic Co., Ltd.: *See*—
Hamamoto, Shoichi; and Hiwatashi, Masaaki, 4,178,145, Cl. 425-199.000.

Laboratories Made, S. A.: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

Labovitz, Jeffrey N.: *See*—
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100.

Lacasse, Rejean. Furniture with opening flap and support therefor. 4,177,738, Cl. 108-78.000.

Lachaize, Henri G., to Societe Anonyme Automobiles Citroen. Transmission mechanism with hydrokinetic coupling device and reversing device. 4,177,694, Cl. 74-732.000.

Lachance, Ernest J., Sr.: *See*—
Jean, Leonard P.; and Lachance, Ernest J., Sr., 4,178,470, Cl. 174-168.000.

Lacour, Alain P.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.

Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, to RCA Corporation. Half wave protection layers on injection lasers. 4,178,564, Cl. 331-94.50H.

Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., to Le Material Telephonique. Time-division switching telephone exchange comprising a service signal sender. 4,178,483, Cl. 179-15.0BY.

Lahut, Joseph A.: *See*—
Berkowitz, Ami E.; and Lahut, Joseph A., 4,178,405, Cl. 428-215.000.

Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., to ACF Industries, Incorporated. Packing gland assembly. 4,177,998, Cl. 277-59.000.

Lake, Don W.; and Subramanian, Nagaraja, to Fairchild Camera and Instrument Corporation. Switch selector and actuator. 4,178,487, Cl. 179-90.0BD.

Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, to Enterprises International, Inc. Apparatus for generating heat from waste fuel. 4,177,740, Cl. 110-213.000.

Lambertz, Martin R., to Stanley Works, Limited, The. Fastening method and product. 4,177,545, Cl. 29-11.000.

Lampert, Albert J. Insulated furnace structure. 4,177,616, Cl. 52-509.000.

Lamson, Junior J.: *See*—
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,178,327, Cl. 525-169.000.

Lancaster, Patrick R., III: *See*—
Lancaster, William G.; and Lancaster, Patrick R., III, 4,177,959, Cl. 242-58.200.

Lancaster, William G.; and Lancaster, Patrick R., III. Flying splice apparatus and process. 4,177,959, Cl. 242-58.200.

Landamore, Leslie E., to Pilgrim Engineering Developments Limited. Sea cock valve. 4,177,971, Cl. 251-215.000.

Lande, Arnold J. Artificial heart. 4,177,523, Cl. 3-1.700.

Landini, Pier C.: *See*—
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500.

Lane, Parley C., Jr.: *See*—
Tenney, Linwood P.; and Lane, Parley C., Jr., 4,178,424, Cl. 526-283.000.

Lane, Robert W., to C. W. Zumbiel Company, The. Carton. 4,177,918, Cl. 229-39.00B.

Langdon, William K., to BASF Wyandotte Corporation. Amine-coupled polyepichlorohydrin and polyamines derived therefrom. 4,178,434, Cl. 528-405.000.

Lantzsch, Reinhard: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.

Lanzisera, Joseph C. Washing machine for cleaning cooking pots or similar articles. 4,177,534, Cl. 15-56.000.

LaPan, LeRoy A. Ferrous object retriever. 4,178,029, Cl. 294-65.500.

Lapir, Gennady M.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Lardenoit, Vernon F.: *See—*
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.

Larson, Ivar W.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Lasco, Inc.: *See—*
Dykes, Willis G., 4,177,603, Cl. 47-1.300.

Lattmann, Werner: *See—*
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.

Laudig, Ronald C., to AMP Incorporated. Plug termination for coaxial cable. 4,178,054, Cl. 339-95.00R.

Lauro, Fernand; and Podevin, Roland, to Commissariat a l'Energie Atomique. Leak-tight coupling device. 4,178,021, Cl. 285-255.000.

Lazarus, Harry J. Spectacle frame with angularly adjustable temples and means for manufacturing and assembling same. 4,178,116, Cl. 408-108.000.

Le Material Telephonique: *See—*
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Leavitt, Richard I., to Ethyl Corporation. Process for producing citric acid. 4,178,211, Cl. 195-30.000.

Lech, Joseph M.: *See—*
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., 4,178,534, Cl. 315-39.000.

Lechevin, Jean-Claude, to Lipha-Lyonnaise Industrielle Pharmaceutique. Novel rodenticidal compositions employing chlorophacinone. 4,178,388, Cl. 424-331.000.

Lechler, Rolf: *See—*
Leitermann, Wulf; and Lechler, Rolf, 4,177,786, Cl. 123-196.00R.

Ledenbach, Gregory W.; and Morris, Dennis E., to National Semiconductor Corporation. Recognition of a received signal as being from a particular transmitter. 4,178,549, Cl. 325-38.00R.

Ledey, Jean C.: *See—*
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., to Reynolds Metals Company. Method of forming a container. 4,177,746, Cl. 113-120.00H.

Lee, Hop. Electric plug with novel cable securing means. 4,178,056, Cl. 339-103.00R.

Lee Industries, Inc.: *See—*
Price, Lewis H., 4,177,832, Cl. 137-625.470.

Lee, John W., Jr.: *See—*
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Lee, Peter I.; and Holt, Brian, to Ciba-Geigy Corporation. Corrosion inhibited lubricant compositions. 4,178,253, Cl. 252-47.000.

Lee, Richard J. Shotgun shell loading. 4,177,711, Cl. 86-38.000.

Lefcort, Malcolm D.: *See—*
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.

Legris, Andre, to Societe Legris France S.A. Cocks having rotating manipulation spindles. 4,177,972, Cl. 251-288.000.

Leifheit International Guenter Leifheit GmbH: *See—*
Liebscher, Johannes; and Schulein, Rolf G., 4,177,533, Cl. 15-42.000.

Leikhim, John W.; and Mitchell, Sharon J., to Procter & Gamble Company, The. Fabric care compositions containing smectite clay and starch. 4,178,254, Cl. 252-8.600.

Leitermann, Wulf; and Lechler, Rolf, to Audi Nsu Auto Union Aktiengesellschaft. Lubricant feeding means. 4,177,786, Cl. 123-196.00R.

Leong, Basil K. J., to International Research and Development Corporation. Metering device. 4,177,941, Cl. 222-636.000.

Le Pabic, Jean P.: *See—*
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Leprince, Philippe: *See—*
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.

Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., to U.S. Philips Corporation. Electron tube with pyrolytic graphite heating element. 4,178,530, Cl. 313-337.000.

Letertre, Gerard J.: *See—*
Gittos, Maurice W.; and Letertre, Gerard J., 4,178,463, Cl. 562-574.000.

Leusner, Bernhard: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Leveque, Jean-Luc; and Gras, Gilbert, to L'Oreal. Apparatus for measuring the mechanical characteristics of a material such as living skin. 4,177,798, Cl. 128-2.00S.

Levine, Arthur: *See—*
Kofsky, Harvey I.; and Levine, Arthur, 4,177,819, Cl. 128-422.000.

Levis, Curt A.: *See—*
United States of America, National Aeronautics and Space Administration; and Levis, Curt A., 4,178,100, Cl. 356-216.000.

Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., to Garrett Corporation, The. Electrohydraulic proportional actuator apparatus. 4,177,713, Cl. 91-375.00R.

Lewis Refrigeration Co.: *See—*
Overbye, Milan R., 4,177,647, Cl. 62-63.000.

Lewis, Robert P.: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.

Lewison, Howard L., to Dynamics Corporation of America. Cultivator tool shank assembly. 4,177,865, Cl. 172-705.000.

Liao, Paul F.: *See—*
Bjorklund, Gary C.; Bloom, David M.; and Liao, Paul F., 4,178,079, Cl. 350-353.000.

Liebermann, Howard H., to General Electric Company. Critical gas boundary layer Reynolds number for enhanced processing of wide glassy alloy ribbons. 4,177,856, Cl. 164-87.000.

Liebscher, Johannes; and Schulein, Rolf G., to Leifheit International Guenter Leifheit GmbH. Cleaning device. 4,177,533, Cl. 15-42.000.

Liechti, Peter: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.

Liggett Group Inc.: *See—*
Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., 4,177,822, Cl. 131-17.00R.

Likharev, Konstantin K.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Liljegren, Gote: *See—*
Bondpers, Per-Erik; and Liljegren, Gote, 4,178,338, Cl. 264-42.000.

Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., to Automation Equipment Inc. Tracer head. 4,177,567, Cl. 33-23.00K.

Lindenbaum, Siegfried: *See—*
Higuchi, Takeru; and Lindenbaum, Siegfried, 4,178,376, Cl. 424-258.000.

Lindner, Henry, to Beatrice Foods Co. Demountable two-component roadway signal assembly. 4,177,749, Cl. 116-63.00T.

Lindquist, Everet F., to University of Iowa Research Foundation. Golf game and practice apparatus. 4,177,994, Cl. 273-176.0FA.

Ling, Alexander C.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.

Linowiecki, Anthony G.: *See—*
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-356.000.

Lipha-Lyonnaise Industrielle Pharmaceutique: *See—*
Lechevin, Jean-Claude, 4,178,388, Cl. 424-331.000.

Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., to Lippel Cybersonics, Inc. Suspension system for disc recording cutter head. 4,178,489, Cl. 179-100.40C.

Lippel Cybersonics, Inc.: *See—*
Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., 4,178,489, Cl. 179-100.40C.

Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., to Uniroyal, Inc. Noise reduction in pneumatic tires. 4,178,199, Cl. 156-110.00R.

Lipshutz, Bruce H.: *See—*
Wasserman, Harry H.; and Lipshutz, Bruce H., 4,178,286, Cl. 260-239.00A.

Lisle Corporation: *See—*
Pool, James L., 4,178,115, Cl. 408-82.000.

Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K. Method of producing ortho-aminobenzonitrile. 4,178,304, Cl. 260-465.00E.

Lochel, Frank P., Jr., to Amchem Products, Inc. Autodeposited coatings. 4,178,400, Cl. 427-435.000.

Lockey, James E. Device having indicia announcing an event. 4,177,593, Cl. 40-488.000.

Lockheed Electronics Co., Inc.: *See—*
Tarasevich, Andrew, 4,178,515, Cl. 250-551.000.

Lockwood, Harry F.: *See—*
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.

Loeffler, Robert B. Trailer box loader system. 4,178,123, Cl. 414-523.000.

Logan, Robert J., to Inductive Controls Limited. Saturable reactors. 4,178,540, Cl. 323-89.00R.

Lohr & Bromkamp G.m.b.H.: *See—*
Aucktor, Erich, 4,177,654, Cl. 64-21.000.

Longthorpe, Paul L.: *See—*
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.

Lontz, John F., to John F. Lontz Associates, Inc. High fidelity color prints. 4,178,096, Cl. 355-32.000.
Lonza, Ltd.: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,178,298, Cl. 260-346.750.
Loo, Ricky F., to Lyon Metal Products, Incorporated. Shelf box with dual pivoting stop mechanism. 4,178,049, Cl. 312-286.000.
L'Oreal: *See*—
Leveque, Jean-Luc; and Gras, Gilbert, 4,177,798, Cl. 128-2.00S.
Lorenz, Donald H.; and Gruber, Bruce A., to GAF Corporation. (2-Cyano-3,3-diphenylacryloxy) alkylene acrylic acid esters. 4,178,303, Cl. 260-465.00D.
Lorenzen, Heinz-Christen: *See*—
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,177,670, Cl. 73-38.000.
Lorimor, Gregory L.: *See*—
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.
Lorphelin, Michel. Method for collecting energy from swell and plant for carrying out said method. 4,177,643, Cl. 60-496.000.
Louis A. Grant, Inc.: *See*—
Meyers, Leo J.; and Grant, Louis A., 4,177,975, Cl. 266-158.000.
Lovely, John D.: *See*—
Constable, Douglas W.; and Lovely, John D., 4,178,610, Cl. 358-34.000.
Lovis, John B., to Bethlehem Steel Corporation. Method and apparatus for treating one side of a strip. 4,178,397, Cl. 427-300.000.
Lowther, Frank E., to Union Carbide Corporation. Biological intermediate sewage treatment with ozone pretreatment. 4,178,239, Cl. 210-15.000.
Lucas Industries Limited: *See*—
Brotherston, Colin P., 4,178,137, Cl. 417-294.000.
Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung: *See*—
Lucke, Florian, 4,177,957, Cl. 242-53.000.
Lucke, Florian, to Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung. Apparatus for clamping a thread. 4,177,957, Cl. 242-53.000.
Luckenbill, Lawrence F., to Mueller Co. Fire hydrant with improved shoe and valve. 4,177,826, Cl. 137-307.000.
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, to BASF Aktiengesellschaft. Manufacture of symmetrical dialkylureas. 4,178,309, Cl. 260-553.00R.
Lumpp, Gunter, to Rieber Werke Heinrich Rieber KG. Container and closure therefore. 4,177,933, Cl. 220-307.000.
Lura, Loren E., to General Motors Corporation. Energy absorbing mounting for vehicle bumper. 4,178,028, Cl. 293-135.000.
Luther, Henry D., to R. F. Shouptronics Corp. Electronic voting machine. 4,178,501, Cl. 235-54.00F.
Lyday, Richard W.: *See*—
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000.
Lydick, John D.: *See*—
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-856.000.
Lydtin, Hans: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000.
Lyerly, Harold G., to Emerson Electric Co. Switch jumper strap. 4,178,523, Cl. 310-71.000.
Lyon Metal Products, Incorporated: *See*—
Loo, Ricky F., 4,178,049, Cl. 312-286.000.
Maass, Rudolf: *See*—
Cavier, Adolf J. J. F.; and Maass, Rudolf, 4,177,703, Cl. 83-356.300.
MAC Valves, Inc.: *See*—
Neff, James A.; and Fagerlie, Richard A., 4,177,840, Cl. 137-599.000.
MacLennan, Donald J.; and Morris, Edwin E., to General Electric Company. Infrared detection apparatus. 4,178,522, Cl. 250-338.000.
Macronetics, Inc.: *See*—
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
Madson, Ricky D.: *See*—
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Maeda, Tatsuaki: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.
Magirus-Deutz AG: *See*—
Illgner, Eberhard, 4,177,531, Cl. 14-27.000.
Magnavox Company, The: *See*—
Beutel, Robert C., 4,178,609, Cl. 358-31.000.
Magnesium Elektron Limited: *See*—
Roebuck, Peter; and Petch, James H. T., 4,178,177, Cl. 75-135.000.
Magnetic Peripherals Inc.: *See*—
Green, Paul N.; and Duff, James A., 4,177,899, Cl. 206-509.000.
Maheo, Guy, to Societe Civile G. M. Maheo - Conseil. Apparatus and method for collecting oysters. 4,177,759, Cl. 119-4.000.
Maier, Gerhard: *See*—
Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, 4,178,050, Cl. 316-19.000.
Mailer, Werner H.; and Milliser, Charles E., to General Electric Company. Print gap adjust mechanism for printers. 4,178,106, Cl. 400-57.000.
Makeev, Jury A.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Makino, Takao: *See*—
Hotta, Toshihiro; and Makino, Takao, 4,178,508, Cl. 250-355.000.
Makuch, John A., to Combustion Engineering Inc. Pulverizer air flow and temperature control. 4,177,951, Cl. 241-35.000.
Malbec, Edouard. Anti-bubble safety valve for a liquid-circuit. 4,177,808, Cl. 128-214.00R.
Malpass, Dennis B.: *See*—
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.
Malyshev, Ivan F.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Manabe, Masami: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Mancini, Angelo J.; and Galloway, Ronald W. Apparatus and method for cleaning and polishing cartridge cases. 4,178,189, Cl. 134-6.000.
Mangiante, Gerard A.: *See*—
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Manners, David E., to GTE Sylvania Incorporated. Dual-mode horizontal output stage. 4,178,536, Cl. 315-408.000.
Mannesmann Aktiengesellschaft: *See*—
Hakert, Karl-Heinz; and Quitmann, Walter, 4,178,200, Cl. 156-187.000.
Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, 4,177,661, Cl. 72-128.000.
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., to Uniroyal, Inc. N-substituted triorganostannylhydro-carbylcarboxylic acid hydrazides. 4,178,382, Cl. 424-288.000.
Marchant, Nicholas G., to Waterford Ironfounders Limited. Wood-burning stoves. 4,177,791, Cl. 126-65.000.
Marchelletta, Ronald L.; and Wheeler, Charles W., to Moto-Tronics. Electromechanical engine timing device. 4,177,781, Cl. 123-146.50A.
Marchus, L. Mark. Guidance arm for tripod apparatus. 4,177,967, Cl. 248-178.000.
Marcus, Konrad H., to Prince Corporation. Drawer light. 4,178,626, Cl. 362-133.000.
Margetts, Hugh G., to Girling Limited. Discs for disc brakes. 4,177,883, Cl. 188-218.0XL.
Marinace, John C., to International Business Machines Corporation. Formation of epitaxial tunnels utilizing oriented growth techniques. 4,178,197, Cl. 148-175.000.
Marks, Alvin M.; and Marks, Mortimer. 3-Dimensional camera device. 4,178,090, Cl. 354-117.000.
Marks, Mortimer: *See*—
Marks, Alvin M.; and Marks, Mortimer, 4,178,090, Cl. 354-117.000.
Marocco, Giuseppe. Method for the production of slabs of marble or similar stony material. 4,177,789, Cl. 125-1.000.
Marshall, Albert H.; and Siragusa, George A., to United States of America, Navy. Laser marksmanship target. 4,177,580, Cl. 35-25.000.
Martens, Peter: *See*—
Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.
Martin, Tellis A.; and Comer, William T., to Mead Johnson & Company. Benzoic acid derivatives. 4,178,301, Cl. 260-455.00R.
Martineau, Jacques, to Caelter Enterprises, Ltd. Hydraulic anti-shimmy device for caster wheels. 4,178,007, Cl. 280-80.00R.
Martinez Roldan, Cristobal: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.
Marumo, Shingo; and Katayama, Masato, to Noda Institute For Scientific Research. Novel bicyclodecadiene compounds and process for producing them. 4,178,462, Cl. 562-501.000.
Maruyama, Kimiomi; Hata, Yoshitaka; and Ohnishi, Akihiro, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,177,777, Cl. 123-119.00A.
Marvin Glass & Associates: *See*—
Meyer, Burton C.; and Schoenfield, Palmer J., 4,177,991, Cl. 273-95.00B.
Marz, Frank H., to Bunker Ramo Corporation. Sweep seconds to jump seconds conversion for clocks. 4,177,630, Cl. 58-7.000.
Mason, Edward D.: *See*—
Hall, Seymour G.; and Mason, Edward D., 4,178,399, Cl. 427-381.000.
Masreliez, Carl J. Dental pulp tester. 4,177,799, Cl. 128-2.10R.
Massachusetts Institute of Technology: *See*—
Demain, Arnold L.; and Kohsaka, Masanobu, 4,178,210, Cl. 195-29.000.

Massey-Ferguson Services N.V.: *See*—
McNaught, James B., 4,177,626, Cl. 56-14.500.
Masumoto, Yoji: *See*—
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.
Mather & Platt Limited: *See*—
Bray, Geddes A., 4,177,862, Cl. 169-17.000.
Mathews, Marion J.: *See*—
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., 4,178,305, Cl. 260-465.900.
Matsuda, Masamichi: *See*—
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, to Agency of Industrial Science & Technology. Oil coagulant and process for preparation thereof. 4,178,265, Cl. 252-316.000.
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Device for measuring light incident on an image forming optical system. 4,178,084, Cl. 354-59.000.
Matsumoto, Yoichi: *See*—
Tashiro, Koji; and Matsumoto, Yoichi, 4,178,156, Cl. 55-5.000.
Matsumura, Susumu: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Matsushita Electric Industrial Company, Limited: *See*—
Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,177,549, Cl. 29-564.200.
Mattel, Inc.: *See*—
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Matthews, Russell B., to Johnson Controls, Inc. Fuel ignition control system. 4,178,149, Cl. 431-46.000.
Matthijsen, Rutger: *See*—
Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., 4,178,362, Cl. 424-48.000.
Mattone, Roberto; and Catoni, Mario, to SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Process for the purification of caprolactam by means of ozone. 4,178,287, Cl. 260-239.30A.
Mattson, Timothy J.: *See*—
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Matula, Jerry: *See*—
Kleist, Robert A.; and Matula, Jerry, 4,177,731, Cl. 101-336.000.
Matuschek, Josip; and Chister, Rene A., to Townsend Textron. Blind fastener. 4,177,710, Cl. 85-70.000.
Maul Lochkartenkerate GmbH: *See*—
Maul, Michael, 4,177,981, Cl. 270-58.000.
Maul, Michael, to Maul Lochkartenkerate GmbH. Collating method and machine. 4,177,981, Cl. 270-58.000.
Maury, Christian, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Phase comparator arrangement for controlling an electrical member. 4,178,560, Cl. 331-1.00A.
Mauser Kommandit-Gesellschaft: *See*—
Hammes, Theo; and Hoff, Alois, 4,177,934, Cl. 220-319.000.
Maxcap Inc.: *See*—
Von Hagel, Leo, 4,177,906, Cl. 215-252.000.
Maximenko, Nikolai S.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Mayahara, Kiyoshi: *See*—
Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,177,549, Cl. 29-564.200.
McCain Manufacturing Corporation: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
McCain, William B.: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
McCallister, Robert A.: *See*—
Daman, Ernest L.; and McCallister, Robert A., 4,177,858, Cl. 165-11.000.
McCarthy, Charles C., to Westinghouse Electric Corp. Monitoring the operation status of an electrical component on the basis of an inherent pull up or pull down characteristic. 4,178,542, Cl. 324-51.000.
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., to Conoco, Inc. Process for producing premium coke from vacuum residuum. 4,178,229, Cl. 208-50.000.
McConnell, Richard L.: *See*—
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R.
McCormack, John L.: *See*—
Van Wilson, Marlin; Nickell, Larry C.; and McCormack, John L., 4,177,838, Cl. 139-353.000.
McCormick, Mathew, to Bowthorpe-Hellermann Limited. Clip for fixing an electric cable to a support structure. 4,178,057, Cl. 339-103.00M.
McCormick, Virgil K.: *See*—
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., to TRW, Inc. Communication processor apparatus for use in a TDM switching system. 4,178,479, Cl. 179-15.0BY.
McDonald, John C.: *See*—
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDunn, Edward C. Apparatus for sharpening a chain saw. 4,177,697, Cl. 76-25.00A.
McFarland, Lorrell C. Apparatus and method of heating and cooling. 4,177,651, Cl. 62-238.000.
McFarland, William W.: *See*—
Ford, Mack L., Jr.; and McFarland, William W., 4,177,936, Cl. 220-441.000.
McFarlin, Henry E.: *See*—
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., to TRW Inc. Remote instrumentation apparatus. 4,178,579, Cl. 340-856.000.
McHugh, John P., to Solar Suede Corporation. Flock fiber feeding apparatus having a plurality of impellers and a venturi flow tube. 4,177,940, Cl. 222-636.000.
McKay, Dwight L., to Phillips Petroleum Company. Passivating metals on cracking catalysts. 4,178,267, Cl. 252-411.00R.
McKee, Maureen K. Fire alarm having a sensor on an extensible arm. 4,178,592, Cl. 340-693.000.
McNally, George S.: *See*—
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.
McNaught, James B., to Massey-Ferguson Services N.V. Crop gathering apparatus. 4,177,626, Cl. 56-14.500.
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., to GTE Laboratories Incorporated. Methods of and apparatus for electrodeless discharge excitation. 4,178,534, Cl. 315-39.000.
Mead Corporation, The: *See*—
Gebhardt, James L.; and Sanders, Carlos L., 4,177,588, Cl. 40-16.400.
Mead Johnson & Company: *See*—
Martin, Tellis A.; and Comer, William T., 4,178,301, Cl. 260-455.00R.
Meckel, Joachim: *See*—
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
Meckel, Joachim F.: *See*—
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.
Meckstroth, Alan F. Hanger for supporting pants and the like and method of production. 4,177,841, Cl. 140-81.500.
Med General, Inc.: *See*—
Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., 4,177,813, Cl. 128-326.000.
Meda, Sergio: *See*—
Riccardi, Clemente C.; Meda. Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Meek, Nigel W.: *See*—
Knight, Andrew C.; and Meek, Nigel W., 4,177,625, Cl. 56-13.600.
Meier, Stefan: *See*—
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.
Meierhoefer, Eugene J.: *See*—
Schwartz, Charles M.; and Meierhoefer, Eugene J., 4,177,945, Cl. 239-338.000.
Meisei Chemical Works, Inc.: *See*—
Tomita, Mikio, 4,178,409, Cl. 428-290.000.
Tomita, Mikio, 4,178,410, Cl. 428-290.000.
Meisinger, Robert H.; and Yu, Pyung K., to Rohm and Haas Company. Diphenyl sulfide, sulfoxide and sulfone plant growth regulators. 4,178,169, Cl. 71-98.000.
Melega, Albert, to Cutting Room Appliances Corporation. Cloth-laying machine. 4,177,980, Cl. 270-31.000.
Memeger, Wesley, Jr., to Du Pont de Nemours, E. I., and Company. Process and product. 4,178,419, Cl. 521-89.000.
Menard, Michel: *See*—
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.
Menges, Hans G. L.; Harms, Engelbert G.; and Hegele, Rainer, to Uniroyal, AG. Method and apparatus for mixing viscous materials. 4,178,104, Cl. 366-80.000.
Menzel, Stanley W. O., to Reed Irrigation Systems Pty. Ltd. Irrigation device. 4,177,947, Cl. 239-542.000.
Merck & Co., Inc.: *See*—
Igoe, Robert S., 4,178,390, Cl. 426-43.000.
Sweet, Charles S., 4,178,374, Cl. 424-246.000.
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Merli, Claudio; and Francia, Carlo, to Euteco S.p.A. Structure of pneumatic tire covers. 4,177,852, Cl. 152-354.00R.
Merrell Toraude et Compagnie: *See*—
Gittos, Maurice W.; and Letertre, Gerard J., 4,178,463, Cl. 562-574.000.
Merriman, Henry H.; and White, William J., to Merriman Products, Inc. Inflated vehicle spring and lift. 4,178,015, Cl. 280-711.000.

Merriman Products, Inc.: *See—*
Merriman, Henry H.; and White, William J., 4,178,015, Cl. 280-711.000.

Merten, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Movable mining planer with direction responsive adjustable cutter depth. 4,178,040, Cl. 299-34.000.

Messer, Leonard, to American Minechem Corporation. Method and apparatus for controlled dewaterizing of coal treatment underflow. 4,178,243, Cl. 210-54.000.

Metallgesellschaft AG: *See—*
Tashiro, Koji; and Matsumoto, Yoichi, 4,178,156, Cl. 55-5.000.

Metcalfe, Richard T., to American Optical Corporation. Spectacles hinge. 4,178,081, Cl. 351-153.000.

Metcalfe, Robert A.; and Bourdeau, Romeo G., to United Technologies Corporation. Method of producing solid particles of metal. 4,178,335, Cl. 264-8.000.

Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research & Engineering Co. Combination hydroconversion, fluid coking and gasification. 4,178,227, Cl. 208-50.000.

Meyer, Burton C.; and Schoenfield, Palmer J., to Marvin Glass & Associates. Amusement apparatus. 4,177,991, Cl. 273-95.00B.

Meyer, Danny S.: *See—*
Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., 4,177,998, Cl. 277-59.000.

Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., to Eastman Kodak Company. Hot-melt adhesvies for bonding polyethylene. 4,178,272, Cl. 260-27.00R.

Meyers, George L., to American Can Company. Method of making partitioned tray. 4,177,715, Cl. 93-37.00R.

Meyers, Leo J.; and Grant, Louis A., to Louis A. Grant, Inc. Exhaust hood apparatus with tilting furnace. 4,177,975, Cl. 266-158.000.

Meyers, Theodore J.: *See—*
Cini, Hector J.; and Meyers, Theodore J., 4,178,577, Cl. 367-159.000.

Michalek, Romuald: *See—*
Collins, Martin F.; and Michalek, Romuald, 4,178,350, Cl. 423-248.000.

Mickschl, Lyle H.: *See—*
Brown, Robert C.; and Mickschl, Lyle H., 4,177,812, Cl. 128-284.000.

Midcon Pipeline Equipment Co.: *See—*
Clavin, Edward A., 4,177,914, Cl. 228-49.00B.
Rhoden, Gary S., 4,177,734, Cl. 104-138.00G.

Midrex Corporation: *See—*
Huestis, Allan C., 4,178,151, Cl. 432-1.000.

Mikado, Tsuneo, to Nippon Television Industry Corporation. PAL color television signal generator for control of time base corrector. 4,178,607, Cl. 358-8.000.

Milleon, Roger H.: *See—*
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.

Miller, Alvin L.; and Viscido, Anthony J. Dental implant and method of inserting the same. 4,177,562, Cl. 433-174.000.

Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., to Med General, Inc. Vessel occluder. 4,177,813, Cl. 128-326.000.

Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., to Ederer Incorporated. Cable drum safety brake. 4,177,973, Cl. 254-173.00R.

Miller, Jack V. Three-way brightness fluorescent lampholder fitting. 4,178,535, Cl. 315-53.000.

Miller, Kenneth G., to Respiratory Care, Inc. High volume humidifier/-nebulizer. 4,178,334, Cl. 261-142.000.

Miller, Larry G., to B. F. Goodrich Company, The. Mill wear member. 4,177,955, Cl. 241-183.000.

Miller, Taylor C., Jr. Method for reducing dental plaque and pellicle precursor of plaque. 4,178,363, Cl. 424-49.000.

Millevoi, Eugene: *See—*
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., 4,177,622, Cl. 53-511.000.

Milliser, Charles E.: *See—*
Mailer, Werner H.; and Milliser, Charles E., 4,178,106, Cl. 400-57.000.

Minnesota Mining and Manufacturing Company: *See—*
Brown, Robert C.; and Mickschl, Lyle H., 4,177,812, Cl. 128-284.000.
Weavers, Mark W.; and Konkler, Anthony W., 4,177,896, Cl. 206-387.000.

Minolta Camera Kabushiki Kaisha: *See—*
Okano, Yukio, 4,178,611, Cl. 358-44.000.
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, 4,178,092, Cl. 355-3.00R.

Misawa, Yoshihiko: *See—*
Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,177,549, Cl. 29-564.200.

Mitchell, Howard E., to Dresser Industries, Inc. System for boring raises having portions of different diameters. 4,177,866, Cl. 175-53.000.

Mitchell, Richard F., to U.S. Philips Corporation. Acoustic surgave wave resonator devices. 4,178,571, Cl. 333-194.000.

Mitchell, Sharon J.: *See—*
Leikhim, John W.; and Mitchell, Sharon J., 4,178,254, Cl. 252-8.600.

Mitel Corporation of Kanata: *See—*
Cowpland, Michael C. J.; and Beirne, Patrick R., 4,178,485, Cl. 179-18.0FA.

Mitsche, Roy T.: *See—*
Antos, George J.; Hayes, John C.; and Mitsche, Roy T., 4,178,268, Cl. 252-439.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Aiga, Makoto; and Hasegawa, Seiji, 4,178,455, Cl. 560-24.000.

Mittendorf, Theodor H. Vehicle insect protection apparatus. 4,178,034, Cl. 296-91.000.

Miyamoto, Masao, to Kabushiki Kaisha Daini Seikosha. Time correcting means for a digital electronic watch. 4,177,633, Cl. 58-23.00R.

Miyata, Katsuharu: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Aiga, Makoto; and Hasegawa, Seiji, 4,178,455, Cl. 560-24.000.

Mizenko, Joseph M.: *See—*
Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, 4,178,421, Cl. 525-4.000.

Modine Manufacturing Company: *See—*
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., 4,177,861, Cl. 165-101.000.

Modular Systems, Inc.: *See—*
Welch, Montgomery J., 4,178,047, Cl. 312-140.000.

Moelker, Huibert C. T.: *See—*
Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., 4,178,362, Cl. 424-48.000.

Mogaki, Katsuo: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,178,184, Cl. 96-74.000.

Mogensen, Vagn: *See—*
Jespersen, Emil; and Mogensen, Vagn, 4,177,892, Cl. 198-832.000.

Moinet, Gerard H.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.

Moll, Manfred: *See—*
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, 4,177,733, Cl. 102-93.000.

Mondabaugh, Susan M.; and Gomez, Magdalena U., to Hoffmann-La Roche Inc. Immunoassay method. 4,178,359, Cl. 424-1.000.

Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, to CRAF Sud. Hydrazono derivatives of cephalosporins. 4,178,444, Cl. 544-30.000.

Monsanto Company: *See—*
Baker, Joseph W.; Cova, Dario R.; and White, James E., 4,178,353, Cl. 423-300.000.
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., 4,178,305, Cl. 260-465.900.
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., 4,178,209, Cl. 195-1.800.

Montavon, Marc; and Reiner, Roland, to Hoffmann-La Roche Inc. Derivatives of 7 [-substituted oxyimins acetamido] cephalosporins. 4,178,443, Cl. 544-27.000.

Montedison S.p.A.: *See—*
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.

Mooi, Raymond: *See—*
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, 4,178,392, Cl. 426-96.000.

Moolenaar, Antonie J.: *See—*
Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., 4,177,609, Cl. 51-170.0EB.

Moore Business Forms, Inc.: *See—*
Halse, Per W., 4,178,018, Cl. 282-11.50A.

Moore, Melvin E.: *See—*
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,177,724, Cl. 100-26.000.

Moorehead, Harvey R., to Warner-Lambert Company. Intravenous catheter apparatus and method. 4,177,809, Cl. 128-214.400.

More, Keith A.; and Bianco, Donald R., to Bendix Corporation, The. Sensitivity proportional counter window. 4,178,509, Cl. 250-374.000.

Morgan, Barry A., to Reckitt & Colman Products Limited. Tetrapeptide derivatives. 4,178,371, Cl. 424-177.000.

Morgunsky, Evgeny I.: *See—*
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V., 4,177,699, Cl. 82-1.00C.

Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, to Matsushita Electric Industrial Company, Limited. Machine for mounting electrical components onto printed-circuit boards. 4,177,549, Cl. 29-564.200.

Mori, Masaharu: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,178,552, Cl. 325-479.000.

Mori, Takasuke: *See—*
Narita, Kiichi; Mori, Takasuke; and Ito, Takamichi, 4,178,175, Cl. 75-93.00E.

Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Diesel engine fuel control apparatus. 4,177,788, Cl. 123-97.00B.

Moriyama, Hideki: *See—*
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,178,558, Cl. 330-11.000.

Morris, Dennis E.: *See—*
Ledenbach, Gregory W.; and Morris, Dennis E., 4,178,549, Cl. 325-38.00R.

Morris, Edwin E.: *See—*
MacLennan, Donald J.; and Morris, Edwin E., 4,178,522, Cl. 250-338.000.

Morrison, Bertram L., to ACF Industries, Incorporated. Valves having a pressure equalizer across dual face seals. 4,177,833, Cl. 137-625.120.

Morton-Norwich Products, Inc.: *See—*
Wright, George C.; and White, Ronald E., 4,178,452, Cl. 546-297.000.

Morton, Richard G., to Jersey Nuclear-Avco Isotopes, Inc. Fluid laser flow channel liner. 4,178,565, Cl. 331-94.50D.

Morton, Roger H. Floated bag trap. 4,177,601, Cl. 43-102.000.

Moses, Darcy C., to Darmo Corporation. Power transmission mechanism. 4,177,683, Cl. 74-200.000.

Moshal, John H., to Control Logic (Proprietary) Limited. Control valves. 4,177,774, Cl. 123-102.000.

Moss, Lester I., to Mosstype Corporation. Angular indexing mechanism for orienting workpiece. 4,177,696, Cl. 74-826.000.

Mosstype Corporation: *See—*
Moss, Lester I., 4,177,696, Cl. 74-826.000.

Moto-Tronics: *See—*
Marchelletta, Ronald L.; and Wheeler, Charles W., 4,177,781, Cl. 123-146.50A.

Motorola, Inc.: *See—*
Davis, William F., 4,178,584, Cl. 340-347.0DA.
Simonelic, Joseph J.; and Ho, Roland K., 4,178,621, Cl. 361-283.000.

Mouchet, Jacques M.: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.

Mougin, Georges L., to ITI Limited. Device for attaching propulsion units to a tabular iceberg. 4,177,748, Cl. 115-76.000.

Moutonnier, Claude: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.

Mrdjen, Peter, to Xerox Corporation. Real time grating clock for galvanometer scanners in laser scanning systems. 4,178,064, Cl. 350-6.600.

Mueller Co.: *See—*
Luckenbill, Lawrence F., 4,177,826, Cl. 137-307.000.

Muendel, Gerald, to Siemens Aktiengesellschaft. Schottky transistor with low residual voltage. 4,178,603, Cl. 357-15.000.

Muir, Alexander R.: *See—*
Hon, David T.; Brueseelbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.

Muller, Franz: *See—*
Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, 4,177,661, Cl. 72-128.000.

Muller, Willi: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.

Munson, Ramon J., to Bourns, Inc. Valve assembly permitting independent peak flow and decay rate control of periodic gas flows. 4,177,830, Cl. 137-501.000.

Murakami, Hiroyasu: *See—*
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.

Murakami, Takuzi: *See—*
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,178,017, Cl. 280-740.000.

Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, to Canon Kabushiki Kaisha. Magnetic brush developing device for developing electrostatic latent images. 4,177,757, Cl. 118-658.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.

Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, to Kao Soap Co., Ltd. Sequestering agent. 4,178,354, Cl. 423-306.000.

Murphy, Michael P.; and Willis, Raymond D., to General Motors Corporation. Solid electrolyte oxygen sensor with electrically isolated heater. 4,178,222, Cl. 204-195.00S.

Murray, John C. Flip-top can construction. 4,177,929, Cl. 220-270.000.

Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation composition and process for producing said composition. 4,178,269, Cl. 252-441.000.

Muth, Hans-Albrecht; and v. d. Marwitz, Hans-Gunther, to Bayerische Motoren Werke Aktiengesellschaft. Motorcycle covering. 4,178,033, Cl. 296-78.100.

N. V. Verto: *See—*
van Turnhout, Jan; and Rieke, Johannes C., 4,178,157, Cl. 55-155.000.

Nachbur, Hermann; and Rohringer, Peter, to Ciba-Geigy Corporation. Amidophosphate reaction products used as flameproofing agents. 4,178,398, Cl. 427-379.000.

Nachev, Georgi N.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Nagaoka, Tadahiko: *See—*
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,178,017, Cl. 280-740.000.

Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, to Tokyo Shibaura Electric Co., Ltd. DC Level clamping circuit. 4,178,558, Cl. 330-11.000.

Nagy, Gerard D.: *See—*
Powell, Peter J.; and Nagy, Gerard D., 4,178,339, Cl. 264-61.000.

Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, to Nippondenso Co., Ltd.; and Toyota Jidosha Kobyo Kabushiki Kaisha. Carburetors with heating device. 4,177,778, Cl. 123-122.00F.

Nakagawa, Hiroshi, to Tokyo Kikai Seisakusho Ltd. Automatic paper splicing control device. 4,177,960, Cl. 242-58.300.

Nakajima, Fumito: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.

Nakajima, Yasuo: *See—*
Kuroda, Hiroshi; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,177,640, Cl. 60-274.000.

Nakamura, Michiharu; and Umeda, Junichi, to Hitachi, Ltd. Semiconductor laser device. 4,178,604, Cl. 357-18.000.

Nakamura, Shigeo: *See—*
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, 4,178,464, Cl. 562-535.000.

Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, to Murata Manufacturing Co., Ltd. Piezoelectrically driven tuning fork resonator and mounting structure. 4,178,526, Cl. 310-321.000.

Nakaoka, Azuma; and Takahashi, Sankichi, to Hitachi, Ltd. Filtration method. 4,178,245, Cl. 210-81.000.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,177,787, Cl. 123-198.00D.

Nakatani, Genji: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.

Nakauji, Masakazu: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.

Narita, Kiichi; Mori, Takasuke; and Ito, Takamichi, to Kobe Steel, Ltd. Method for agitating a bath of melted metal for treating the same. 4,178,175, Cl. 75-93.00E.

Naruse, Norio: *See—*
Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, 4,178,454, Cl. 560-2.000.

Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, to Toray Industries, Inc. Stabilized prostaglandin E composition. 4,178,454, Cl. 560-2.000.

National Engineering Company: *See—*
Rikker, Leslie D., 4,177,952, Cl. 241-40.000.

National Patent Development Corporation: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.

National Semiconductor Corporation: *See—*
Ledenbach, Gregory W.; and Morris, Dennis E., 4,178,549, Cl. 325-38.00R.

Natnenkov, Alexei I.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Naylor, Floyd E.: *See—*
Hsieh, Henry L.; and Naylor, Floyd E., 4,178,275, Cl. 260-33.60A.

Nayrole, Bernard J. P.: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.

NCR Corporation: *See—*
Eifort, Ralph C., 4,178,053, Cl. 339-75.0MP.

Neef, Gunter: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.

Neel, Jean: *See—*
Boutin, Jean; and Neel, Jean, 4,178,221, Cl. 204-159.230.

Neff, James A.; and Angerlie, Richard A., to MAC Valves, Inc. Pressure regulation and flow control valve with combination needle and check valves. 4,177,840, Cl. 137-599.000.

Neilson, William J., to Smith International, Inc. Abrasion resistant bearing seal. 4,178,045, Cl. 308-8.200.

Nelson, Robert L., Jr., to Tractor, Inc. Digital phase detector and method. 4,178,631, Cl. 364-484.000.

Nemechek, Alfred E.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Neth, Norbert: *See—*
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.

Nichols, Richard A., to Rockwell International Corporation. Amplifier distortion reduction apparatus. 4,178,559, Cl. 330-296.000.

Nickell, Larry C.: *See—*
Van Wilson, Marlin; Nickell, Larry C.; and McCormack, John L., 4,177,838, Cl. 139-353.000.

Nicol, Henri: *See—*
Thomas, Georges; and Nicol, Henri, 4,178,202, Cl. 159-15.000.

Nielsen, Steven T., to Beckman Instruments, Inc. One piece chylomicron rotor liner. 4,177,921, Cl. 233-20.00R.

Niemi, Tom O.: *See—*
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., 4,178,172, Cl. 75-0.5BA.

Nikiforov, Jury V.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Nippon Electric Co., Ltd.: *See—*
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, 4,178,613, Cl. 358-183.000.
Uchida, Teiji; and Ueki, Atsufumi, 4,178,073, Cl. 350-151.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kajiwara, Takao, 4,177,990, Cl. 273-73.00C.
Ogita, Minoru; and Ishigaki, Yuzo, 4,178,551, Cl. 325-427.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,177,787, Cl. 123-198.00D.

Nippon Steel Corporation: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.

Nippon Television Industry Corporation: *See—*
Mikado, Tsuneo, 4,178,607, Cl. 358-8.000.

Nippondenso Co., Ltd.: *See—*
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.

Nippondenso Kabushiki Kaisha: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Nishihata, Yukihiro, to TOA Electric Co., Ltd. Telephone set. 4,178,488, Cl. 179-100.00L.

Nishino, Yukishige: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.

Nishioka, Kunihiko: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.

Nishiyama, Hiroshi: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.

Nissan Motor Company, Limited: *See—*
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,177,886, Cl. 192-4.00A.
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,178,017, Cl. 280-740.000.
Kuroda, Hiroshi; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,177,640, Cl. 60-274.000.
Maruyama, Kimiomi; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,177,777, Cl. 123-119.00A.
Sekiguchi, Tomoyoshi; and Fujii, Masayuki, 4,177,977, Cl. 267-64.00R.

Nitto Boseki Co., Ltd.: *See—*
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.

Niwa, Yukichi: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.

Noda Institute For Scientific Research: *See—*
Marumo, Shingo; and Katayama, Masato, 4,178,462, Cl. 562-501.000.

Noehren, William L.: *See—*
Ferris, Donald L.; and Noehren, William L., 4,178,130, Cl. 416-107.000.

Nollet, Anthony R., to Cargill, Incorporated. Apparatus for separating solid materials. 4,178,232, Cl. 209-3.000.

Nomura, Shigeyoshi: *See—*
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.

Nomura, Takashi: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Nonaka, Yasuhiko, to Hitachi, Ltd. Method for manufacturing an image pickup tube target. 4,178,196, Cl. 148-174.000.

Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., to International Nickel Company, Inc., The. Process for bipolar electrode support structures. 4,178,216, Cl. 204-2.100.

Norman, Vello: *See—*
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Norris Industries, Inc.: *See—*
Beisch, Hans R.; Apczynski, Frederick A.; and Gillespie, James E., 4,178,043, Cl. 301-37.0SS.

Northrop Corporation: *See—*
Rowlett, Robert P., 4,178,596, Cl. 343-18.00E.

Novinger, Harry E. Evacuated-tube solar collector. 4,177,794, Cl. 126-270.000.

Novo Industri A/S: *See—*
Guddal, Erling, 4,178,294, Cl. 260-326.400.

Novotny, Ronald J.: *See—*
Taylor, Frank D.; and Novotny, Ronald J., 4,178,475, Cl. 179-2.0EC.

Noyori, Kazumasa: *See—*
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,178,558, Cl. 330-11.000.

NSK-Warner K.K.: *See—*
Kikuchi, Kouichi, 4,177,839, Cl. 139-419.000.

Nuclear Semiconductor: *See—*
Dubois, Jaques, deceased; and Zulliger, Hans R., 4,178,513, Cl. 250-491.000.

Nuclepore Corporation: *See—*
Porter, Mark C.; and Olson, Wayne P., 4,178,248, Cl. 210-167.000.

Nudelman, Rafail M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

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Nunogaki, Yoshiaki, to Sanki Engineering Ltd. Cell fragility testing method and appliance therefor. 4,178,152, Cl. 23-230.00B.

Nutku, Ata. Rotary engines with free reciprocating-rotating pistons and jet thrust drive. 4,177,771, Cl. 123-43.00C.

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Emmons, William D.; and Nyi, Kayson, 4,178,425, Cl. 528-73.000.

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Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

O.K. Machine and Tool Corp.: *See—*
Weltman, David; and Rivera, Thomas, 4,177,555, Cl. 29-751.000.

Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, to Kawasaki Steel Corporation; and Kurimoto Iron Works, Ltd. Tuyere for a melting furnace. 4,177,976, Cl. 266-266.000.

Occidental Oil Shale, Inc.: *See—*
Burton, Robert S., III, 4,178,039, Cl. 299-2.000.

Ocel, Donald J.: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000.

Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., to Ocelco, Inc. Restraining belt for patients in wheelchairs, stretchers or the like. 4,177,807, Cl. 128-133.000.

Ocel, Thomas: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000.

Ocelco, Inc.: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000.

Oda, Toyohisa; and Inouye, Kinichi, to Japan Steel Works, Ltd., The; and Asahi Kasei Kogyo Kabushiki Kaisha. Clad steel. 4,178,417, Cl. 428-679.000.

Oertel, Harald: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.

Officine Cevolani S.p.A.: *See—*
Pazzaglia, Luigi, 4,177,702, Cl. 83-79.000.

Ogami, Noboru. Self retaining skin retractor. 4,177,802, Cl. 128-20.000.

Ogawa, Hiroshi; Aoki, Shigeta; and Arai, Tatsuo, to Bridgestone Tire Company Limited. Large-sized pneumatic radial tire. 4,177,850, Cl. 152-209.00R.

Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, to Dynic Corporation. Yellowing resistant label comprising a porous polyamide layer containing a plasticizer. 4,177,586, Cl. 40-2.00R.

Ogita, Minoru; and Ishigaki, Yuzo, to Nippon Gakki Seizo Kabushiki Kaisha. Bandwidth switching circuits of radio receiver. 4,178,551, Cl. 325-427.000.

Ogle, Thomas H. W. W. P. Fuel economy system for an internal combustion engine. 4,177,779, Cl. 123-133.000.

Oguni, Yasuo: *See—*
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, 4,177,671, Cl. 73-146.500.

Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, to Oriental Yeast Co., Ltd. Electrical oxygen probe. 4,178,223, Cl. 204-195.00P.

Ohio Willow Wood Co., Inc.: *See*—
Arbogast, Charles J.; and Arbogast, Robert E., 4,177,525, Cl. 3-7.000.

Ohling, Robert S., to Acoolco Corporation. Freezing apparatus and method. 4,177,648, Cl. 62-73.000.

Ohlinger, Manfred: *See*—
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

Ohnishi, Akihiro: *See*—
Maruyama, Kimiomi; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,177,777, Cl. 123-119.00A.

Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser computer output microfilmer with electrical misalignment correction. 4,178,471, Cl. 178-15.000.

Ohno, Kiyotaka: *See*—
Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, 4,178,454, Cl. 560-2.000.

Ohtsu Tire & Rubber Co., Ltd.: *See*—
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.

Ohuchida, Shuichi: *See*—
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Okada, Masaru; and Kanai, Seikichi, to Kabushiki Kaisha Komatsu Seisakusho. Combustion chamber for an internal combustion engine of direct injection type. 4,177,769, Cl. 123-30.00D.

Okamoto, Allen H.: *See*—
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.

Okamoto, Hisaji: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming an insulating film. 4,178,396, Cl. 427-93.000.

Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Optical low pass filter. 4,178,611, Cl. 358-44.000.

Okazaki, Seiji: *See*—
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.

Okazaki, Shigeru: *See*—
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, 4,177,872, Cl. 181-144.000.

Okuno, Youichi: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including multifunction keys. 4,178,633, Cl. 364-709.000.

Olin Corporation: *See*—
Walker, Ford T., 4,178,347, Cl. 423-185.000.

Olson, Wayne P.: *See*—
Porter, Mark C.; and Olson, Wayne P., 4,178,248, Cl. 210-167.000.

Olsson, Karl E., to ASEA Aktiebolag. Fluid-cooled thyristor valve. 4,178,630, Cl. 363-141.000.

Olympus Optical Company Ltd.: *See*—
Sato, Masaaki, 4,178,477, Cl. 179-6.00R.

Onder, Kemal B.: *See*—
Chen, Augustin T.; and Onder, Kemal B., 4,178,432, Cl. 528-340.000.

Ondetti, Miguel A.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Substituted acyl derivatives of amino acids. 4,178,291, Cl. 549-39.000.

Ono, Masami, to Tokico Ltd. Indicating apparatus for indicating numerals or letters by a plurality number of indicating elements. 4,178,575, Cl. 340-764.000.

Ono Pharmaceutical Co. Ltd.: *See*—
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Onosato, Masashi: *See*—
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, 4,178,613, Cl. 358-183.000.

Ookado, Terumi: *See*—
Yoshinari, Takashi; and Ookado, Terumi, 4,177,782, Cl. 123-148.00C.

Oriental Yeast Co., Ltd.: *See*—
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.

Orlando, Charles M.: *See*—
Gardner, Russell A.; and Orlando, Charles M., 4,178,466, Cl. 568-727.000.

Orscheln Brake Lever Mfg. Co.: *See*—
Orscheln, Don W.; and Bopp, Robert D., 4,178,491, Cl. 200-34.000.

Orscheln, Don W.; and Bopp, Robert D., to Orscheln Brake Lever Mfg. Co. Switch actuator means of the time delay type. 4,178,491, Cl. 200-34.000.

Orsinger, Winston A.; and Fallos, George, to Bell & Howell Company. Signature gathering machine. 4,177,979, Cl. 270-54.000.

Osada, Isao; and Sano, Shoichi, to Ohtsu Tire & Rubber Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Safety wheel. 4,177,849, Cl. 152-158.000.

Osata, Mamoru: *See*—
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, 4,177,872, Cl. 181-144.000.

Ostreng, Arlen J. Hammer-roll recycling plant. 4,177,954, Cl. 241-167.000.

Otisca Industries, Ltd.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,233, Cl. 209-3.000.

Otteson, Kenneth M.; and Dawson, Daniel J., to Dynapol. Ethylsulfonate-alkylamine copolymers as colorant backbones. 4,178,422, Cl. 525-336.000.

Ouellette, Maurice J., to General Electric Company. Automatic gain control circuit and system for using same. 4,178,482, Cl. 179-15.0AN.

Ouellette, Paul J.: *See*—
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.

Outboard Marine Corporation: *See*—
Emmons, J. Bruce, 4,178,331, Cl. 261-23.00A.

Outokumpu Oy: *See*—
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., 4,178,172, Cl. 75-0.5BA.

Overbye, Milan R., to Lewis Refrigeration Co. Air slide freezer system. 4,177,647, Cl. 62-63.000.

Oversohl, Wilhelm, to Wasag Chemie AG. Apparatus for production of combustible ammunition containers. 4,178,207, Cl. 162-384.000.

Ovshinsky, Stanford R.; and Sapru, Krishna, to Energy Conversion Devices, Inc. Modified amorphous semiconductors and method of making the same. 4,178,415, Cl. 428-446.000.

Owada, Mitsutoshi: *See*—
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.

Owens-Corning Fiberglas Corporation: *See*—
Sage, Donald B.; and Krautz, Fred G., 4,178,412, Cl. 428-391.000.
Stevenson, Donald R.; and Schmidt, David A., 4,178,326, Cl. 525-176.000.

Owens-Illinois, Inc.: *See*—
Yarick, Jon R.; and Franks, Nelson J., 4,177,548, Cl. 29-453.000.

Oxley, Robert F. Compact, flat trimmer capacitors. 4,178,622, Cl. 361-293.000.

Oy E. Sarlin AB: *See*—
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.

Paakkinen, Ilmari: *See*—
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Paley, Hyman W. Plastic manifold assembly. 4,177,835, Cl. 137-883.000.

Palomeque, Osvaldo. Dual spark plug ignition system. 4,177,783, Cl. 123-148.00C.

Panzeri, Cesare, to Breda Termomeccanica S.p.A. Apparatus for controlling and taking up axial displacement in machinings on large diameter cylinders. 4,177,644, Cl. 60-721.000.

Papastrat, Arthur L.: *See*—
Du Bois, Edward F.; and Papastrat, Arthur L., 4,177,666, Cl. 72-420.000.

Papay, Andrew G.; and Zaweski, Edward F., to Edwin Cooper, Inc. Lubricating oil composition. 4,178,258, Cl. 252-32.70E.

Papistas-Scherer, Bertha; and Spector, George. Foot exerciser. 4,177,803, Cl. 128-25.00B.

Parker, Warde L.: *See*—
Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., 4,177,713, Cl. 91-375.00R.

Parrish, David R.: *See*—
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.

Parsons, Jack L. Preparation of N-(phosphonoacetyl)-L-aspartic acid. 4,178,306, Cl. 260-502.500.

Pasero, Edoardo: *See*—
Iacotti, Italo; and Pasero, Edoardo, 4,178,170, Cl. 75-3.000.

Pask, George, to Rolls-Royce Limited. Inlet for annular gas turbine combustor. 4,177,637, Cl. 60-39.360.

Passedroit, Hubert: *See*—
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.

Patel, Bhupendra C., to Kendall Company, The. Catheter balloon structure. 4,177,815, Cl. 128-349.00B.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See*—
Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, 4,178,050, Cl. 316-19.000.

Patil, Babgaunda A.: *See*—
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.

Pavlica, Robert T.: *See*—
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.

Pazzaglia, Luigi, to Officine Cevolani S.p.A. Device for automatically forming piles out of strips exiting from a machine on which the said strips are produced. 4,177,702, Cl. 83-79.000.

Pearce, Jacqueline H.: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.
Peiler, Rolf W.; and Rohren, Ronald E., to Deere & Company. Feed rotor for an axial flow rotary combine. 4,177,821, Cl. 130-27.00T.
Pellerin, Albert. Device for increasing the uniformity of the air-fuel mixture in internal combustion engines. 4,177,780, Cl. 123-141.000.
Perkin-Elmer Limited: *See—*
Taylor, Leonard H., 4,178,121, Cl. 414-104.000.
Perry, Wayne W. Stirrup strap fastener. 4,177,623, Cl. 24-176.000.
Petch, James H. T.: *See—*
Roebuck, Peter; and Petch, James H. T., 4,178,177, Cl. 75-135.000.
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., to Singer Company, The. Simulation technique for generating a visual representation of an illuminated area. 4,177,579, Cl. 35-12.00N.
Peters Equipment Corporation: *See—*
Dilley, Gerald G., 4,177,842, Cl. 140-93.600.
Petersen, Steven D. Lens case. 4,177,894, Cl. 206-316.000.
Petrov, Peter D.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.
Pettersen, Alfred. Downrigger release device. 4,177,599, Cl. 43-43.120.
Pfaudler-Werke A.G.: *See—*
Grell, Helmut; and Scharbach, Heinz, 4,177,524, Cl. 3-1.900.
Pfizer Inc.: *See—*
Sciavolino, Frank C., 4,178,436, Cl. 536-9.000.
Thomas, Michael B., 4,178,437, Cl. 536-10.000.
Phelps, Richard D., to Back Bay Company, Inc. Vertically adjustable table. 4,177,739, Cl. 108-144.000.
Phelps, Weldon L., to Caterpillar Tractor Co. Electronic directional control circuit. 4,178,518, Cl. 307-9.000.
Philip Morris, Inc.: *See—*
Teng, Lina C., 4,178,458, Cl. 560-60.000.
Phillips Petroleum Company: *See—*
Farmer, Robert L., 4,178,504, Cl. 250-199.000.
Hsieh, Henry L.; and Naylor, Floyd E., 4,178,275, Cl. 260-33.60A.
McKay, Dwight L., 4,178,267, Cl. 252-411.00R.
Murtha, Timothy P.; and Zuech, Ernest A., 4,178,269, Cl. 252-441.000.
Shue, Robert S.; and Crain, Donald L., 4,178,276, Cl. 260-37.00R.
Photon Power, Inc.: *See—*
Jordan, John F.; and Singh, Vijay P., 4,178,395, Cl. 427-74.000.
Pichl, Heinz, to Ab Volvo Penta. Outboard motor bracket assembly. 4,177,747, Cl. 115-41.0HT.
Pickelman, Dale M.: *See—*
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., 4,178,205, Cl. 162-168.00R.
Pickles, Joseph, to Ferro Manufacturing Corporation. Seat recliner assembly. 4,178,037, Cl. 297-326.000.
Pifferi, Giorgio: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.
Pilgrim Engineering Developments Limited: *See—*
Landamore, Leslie E., 4,177,971, Cl. 251-215.000.
Pilkington P. E. Limited: *See—*
Rogers, Philip J., 4,178,072, Cl. 350-145.000.
Rogers, Philip J., 4,178,075, Cl. 350-175.0FS.
Pilla, Donald P. Alcoholic beverage making composition and process. 4,178,389, Cl. 426-11.000.
Pingaud, Bernard J.: *See—*
Hector, Jean-Marie H.; and Pingaud, Bernard J., 4,178,416, Cl. 428-539.000.
Pinkerton, Harry E. Fluid handling system. 4,178,240, Cl. 210-22.00A.
Pinz, Rochelle; and Silverman, Gordon, to Pinz, Rochelle. Combined computer and recorder for musical sound reproduction. 4,177,708, Cl. 84-1.280.
Pinza, Mario: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.
Pipe Line Development Co., The: *See—*
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.
Plourde, Fernand; and Plourde, Maurice. Apparatus for the excavation of subterranean tunnels. 4,178,111, Cl. 405-142.000.
Plourde, Maurice: *See—*
Plourde, Fernand; and Plourde, Maurice, 4,178,111, Cl. 405-142.000.
Podevin, Roland: *See—*
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Polaroid Corporation: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,178,446, Cl. 544-33.000.
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.
Erlichman, Irving, 4,178,598, Cl. 346-105.000.
Gordon, Michael E.; and Stieger, Frank, 4,177,552, Cl. 29-623.400.
Shenk, Edwin K.; and Tam, Shirley Y., 4,178,087, Cl. 354-195.000.
Polinsky, Murray A., to RCA Corporation. Method of making a bipolar transistor with high-low emitter impurity concentration. 4,178,190, Cl. 148-1.500.
Polizzi, Jerry: *See—*
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.
Pollitt, Joseph F.: *See—*
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.
Polysar Resins, Inc.: *See—*
Crisci, Victor E., 4,177,930, Cl. 220-284.000.
Pool, James L., to Lisle Corporation. Valve seat ring installation tool. 4,178,115, Cl. 408-82.000.
Poole, Judith A. Toilet paper service pedestal. 4,177,958, Cl. 242-55.420.
Porter, Mark C.; and Olson, Wayne P., to Nuclepore Corporation. Non-clogging microporous filter with cross flow operation. 4,178,248, Cl. 210-167.000.
Porter, Vernon R., to Texas Instruments Incorporated. Apparatus for generation and control of dopant and reactive gases. 4,178,224, Cl. 204-237.000.
Pouliot, Oliver L.: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.
Pourrias, Bernard M.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.
Powell, Harry C., Jr., to Powell Machinery, Inc. Automatic fruit bagging. 4,177,621, Cl. 53-468.000.
Powell Machinery, Inc.: *See—*
Powell, Harry C., Jr., 4,177,621, Cl. 53-468.000.
Powell, Peter J.; and Nagy, Gerard D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laminated electrode. 4,178,339, Cl. 264-61.000.
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., to Swingline, Inc. Carrier for holding sheets of material for use with a thermal binding machine. 4,178,201, Cl. 156-499.000.
Powers, Joseph A., to Hoover Company, The. Kinetic brush agitator with back up beater bar. 4,177,536, Cl. 15-182.000.
Poynor, Paul C.: *See—*
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.
Pres-To-Line Corporation of America: *See—*
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Price, Lewis H., to Lee Industries, Inc. Inline ball valve. 4,177,832, Cl. 137-625.470.
Priddy, Duane B., to Dow Chemical Company, The. Organic peroxide compositions. 4,178,263, Cl. 252-186.000.
Prince Corporation: *See—*
Marcus, Konrad H., 4,178,626, Cl. 362-133.000.
Printronix, Inc.: *See—*
Kleist, Robert A.; and Matula, Jerry, 4,177,731, Cl. 101-336.000.
Procter & Gamble Company, The: *See—*
Leikhim, John W.; and Mitchell, Sharon J., 4,178,254, Cl. 252-8.600.
Prodanovich, George L.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Tellier, Pierre; and Weiss, Francis, 4,178,292, Cl. 260-333.000.
Prudnikov, Igor A.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., to Pullman Incorporated. Mechanically and weldingly secured bracket. 4,177,736, Cl. 105-377.000.
Psaras, John D., to Brown & Williamson Tobacco Corporation. Method and apparatus for conditioning material utilizing airflow control means. 4,177,576, Cl. 34-33.000.
PTI - Dolco: *See—*
Robins, Milton, 4,178,025, Cl. 292-117.000.
Puig Planas, Antonio. Seal assembly for bottles or flasks. 4,177,904, Cl. 215-12.00R.
Pujolle, Jean, to Telediffusion de France. Prefabricated element to form a double sound insulation and absorption wall of a dwelling. 4,177,876, Cl. 181-284.000.
Pullman Incorporated: *See—*
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.
Pulvermacher, Wilfried: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Puskas, Alexander. Turbine apparatus. 4,178,124, Cl. 415-2.000.
Puskas, William L.: *See—*
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,178,188, Cl. 134-1.000.
Putter, Rolf: *See—*
Schossler, Willi; Behre, Horst; and Putter, Rolf, 4,178,308, Cl. 260-509.000.
Quaker Oats Company, The: *See—*
Clanton, W. Porter, 4,177,871, Cl. 181-131.000.
Kumar, Surinder, 4,178,394, Cl. 426-656.000.

Queren, James. Burglar alarm system. 4,178,588, Cl. 340-545.000.

Quitmann, Walter: *See—*
Hakert, Karl-Heinz; and Quitmann, Walter, 4,178,200, Cl. 156-187.000.

R. A. Jones & Co. Inc.: *See—*
Weichhand, Robert J., 4,178,120, Cl. 414-41.000.

R. F. Shouptronics Corp.: *See—*
Luther, Henry D., 4,178,501, Cl. 235-54.00F.

R & I Patent Corporation: *See—*
Shepard, Francis H., Jr., 4,178,628, Cl. 363-25.000.

R. T. Vanderbilt Company, Inc.: *See—*
Hill, Harry E., 4,178,280, Cl. 260-45.80A.

Raasch, Ernest M.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.

Rabadan Peinado, Fernando: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

Raber, Harry M., to Allis-Chalmers Corporation. Infinitely adjustable bearing seal for non-parallel surfaces. 4,177,999, Cl. 277-112.000.

Rada, Petr: *See—*
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.

Rahman, Michael, to Envirotech Corporation. Humidifier duct system. 4,178,160, Cl. 55-436.000.

Rain Bird Sprinkler Mfg. Corp.: *See—*
Wichman, William J., 4,177,944, Cl. 239-230.000.

Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., to Skil Corporation. Automatic belt centering device. 4,177,609, Cl. 51-170.0EB.

Randle, Rae. Portable saw mill. 4,177,704, Cl. 83-435.100.

Rasimus, Seppo: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Rastas, Jussi K.: *See—*
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., 4,178,172, Cl. 75-0.5BA.

Rautapaa, Kari: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Rawicki, Waldemar, to Binks Manufacturing Company. Double-acting flexible tube pump. 4,178,133, Cl. 417-63.000.

Rawlings, Don O.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

RCA Corporation: *See—*
Alig, Roger C., 4,178,531, Cl. 313-409.000.
Flatley, Doris W., 4,178,191, Cl. 148-1.500.
Hsu, Sheng T.; and Cartwright, James M., Jr., 4,178,605, Cl. 357-42.000.
Hulls, Leonard R.; and Dowdell, Toy, Jr., 4,178,546, Cl. 324-158.0MG.
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.
Polinsky, Murray A., 4,178,190, Cl. 148-1.500.
Sauer, Donald J., 4,178,614, Cl. 358-213.000.

Reale, Michael J., to Stauffer Chemical Company. Amine antioxidants as antiscorch agents in flame retarded polyurethane foams. 4,178,420, Cl. 521-107.000.

Rebhan, Herbert J.: *See—*
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,370, Cl. 424-177.000.

Reckitt & Colman Products Limited: *See—*
Morgan, Barry A., 4,178,371, Cl. 424-177.000.

Redhead, Walden K. Barbecue rotisserie baster. 4,177,721, Cl. 99-345.000.

Reed Irrigation Systems Pty. Ltd.: *See—*
Menzel, Stanley W. O., 4,177,947, Cl. 239-542.000.

Reed Manufacturing Company: *See—*
Brown, Thomas G., 4,177,558, Cl. 30-103.000.

Reeh, Ulrike: *See—*
Denk, Hans; and Reeh, Ulrike, 4,178,274, Cl. 260-31.80E.

Reff, Robey C.: *See—*
Johnson, George S.; and Reff, Robey C., 4,177,551, Cl. 29-623.100.

Regamey, Pierre E. Method and device for feeding a system of generation and distribution of vapor condensable into make-up liquid. 4,177,767, Cl. 122-456.000.

Regan, Robert J.: *See—*
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., 4,178,534, Cl. 315-39.000.

Regie Nationale des Usines Renault: *See—*
Chamdru, Jacques, 4,177,857, Cl. 164-200.000.
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.

Reich, David: *See—*
Rudner, Bernard; Reich, David; and Galica, Edward, 4,178,161, Cl. 55-524.000.

Reichel, Alfred G., to Black & Decker Inc. Suppressor-insulator member and circuit arrangement therefor. 4,178,617, Cl. 361-43.000.

Reid, Earl; and Copp, Carl A., Jr., to General Motors Corporation. Guide shoe members for wobble plate compressor. 4,178,136, Cl. 417-269.000.

Reindl, John C.: *See—*
Tee, Liong S.; and Reindl, John C., 4,178,435, Cl. 528-501.000.

Reiner, Roland: *See—*
Montavon, Marc; and Reiner, Roland, 4,178,443, Cl. 544-27.000.

Reinhardt, Bruce A.: *See—*
Arnold, Fred E.; and Reinhardt, Bruce A., 4,178,428, Cl. 528-174.000.

Reishauer AG: *See—*
Angst, Arthur, 4,178,537, Cl. 318-603.000.

Renier, Gary L. Ophthalmic device for measuring vertex distance and pantoscopic tilt angle. 4,177,571, Cl. 33-200.000.

Renzi, Alfred A.: *See—*
Wagner, Eugene R.; and Renzi, Alfred A., 4,178,385, Cl. 424-310.000.

Repco Limited: *See—*
Harant, Gerhart W., 4,177,678, Cl. 73-460.000.

Research Corporation: *See—*
Wasserman, Harry H.; and Lipshutz, Bruce H., 4,178,286, Cl. 260-239.00A.

Respiratory Care, Inc.: *See—*
Miller, Kenneth G., 4,178,334, Cl. 261-142.000.

Reudink, Douglas O. J.: *See—*
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,178,550, Cl. 325-41.000.

Reutter, Jorg; and Dietze, Wolfgang, to International Standard Electric Corporation. Hybrid for two-wire full-duplex transmission of digital signals. 4,178,569, Cl. 333-119.000.

Reyner, Emerson M., II: *See—*
Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., 4,178,067, Cl. 350-96.210.

Reynolds, Brian L.: *See—*
Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., 4,177,752, Cl. 166-263.000.

Reynolds, Harold J., Jr., to Johns-Manville Corporation. Friction material for railroad service. 4,178,278, Cl. 260-42.220.

Reynolds, Howard, to General Electric Company. Rejection type fuse clip assembly. 4,178,063, Cl. 339-259.00F.

Reynolds Metals Company: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.

Rheinmetall GmbH.: *See—*
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, 4,177,733, Cl. 102-93.000.

Rhoden, Gary S., to Midcon Pipeline Equipment Co. Drive unit for internal pipe line equipment. 4,177,734, Cl. 104-138.00G.

Rhone-Poulenc Industries: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
Boutin, Jean; and Neel, Jean, 4,178,221, Cl. 204-159.230.

Rhone-Poulenc-Textile: *See—*
Couchoud, Paul, 4,178,283, Cl. 260-45.85R.

Ribeiro Pinto, Luiz Antonio C., to Santal Equipamentos S. A. Comercio E. Industria. Chopping-raising-cleaning assembly for sugar cane harvesting machines. 4,177,953, Cl. 241-58.000.

Ribout, Pierre; and Delory, Bernard, to Thomson-CSF. Microwave delay line for travelling wave tube. 4,178,533, Cl. 315-3.600.

Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, to U.S. Philips Corporation. Process and apparatus for measuring the concentration of a molecule of selective spectrum in a sample substance. 4,178,102, Cl. 356-307.000.

Richman, Jay L., to Bendix Corporation, The. Digital signal transmitter/receiver system including programmable self-test capability. 4,178,582, Cl. 340-146.10E.

Richter, Edward S. Heat recovery system for furnaces and the like. 4,177,766, Cl. 122-20.00B.

Ricoh Company, Ltd.: *See—*
Isayama, Takuro; and Komai, Hiromichi, 4,178,597, Cl. 346-75.000.
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, 4,178,093, Cl. 355-8.000.

Ridgway, John A., Jr.: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.

Rieber Werke Heinrich Rieber KG: *See—*
Lumpp, Gunter, 4,177,933, Cl. 220-307.000.

Rieke, Johannes C.: *See—*
van Turnhout, Jan; and Rieke, Johannes C., 4,178,157, Cl. 55-155.000.

Rieter Machine Works, Ltd.: *See—*
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.

Rikker, Leslie D., to National Engineering Company. Impact scrubber. 4,177,952, Cl. 241-40.000.

Rincon Industries, Inc.: *See—*
Bowen, John G., 4,178,499, Cl. 219-439.000.

Ring Jr., Harry K., to Trane Company, The. Valve assembly for use in an air distribution system. 4,177,970, Cl. 251-61.300.

Ripple, Warren. Loudspeaker equipment. 4,177,873, Cl. 181-148.000.

Rissi, Erwin; and Ebnother, Anton, to Sandoz Ltd. (4-Hydroxy-4-piperidyl)-alkanoic acid amides. 4,178,377, Cl. 424-267.000.

Ritter, James C. Radioisotope photoelectric generator. 4,178,524, Cl. 310-304.000.

Rivera, Thomas: *See—*
Weltman, David; and Rivera, Thomas, 4,177,555, Cl. 29-751.000.
Rizaev, Ramiz G. K. O.: *See—*
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.
Roadarmel, Gary W., to Anderson Company of Indiana, The. Arm to blade connector. 4,177,537, Cl. 15-250.320.
Robert Bosch GmbH: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.
Seiler, Hartmut; and Kugelmann, Adolf, 4,178,619, Cl. 361-91.000.
Robert Krups: *See—*
Brindopke, Dieter, 4,178,500, Cl. 219-524.000.
Roberts, Richard W., to Borg-Warner Corporation. Variable capacity compressor. 4,178,135, Cl. 417-222.000.
Robertshaw Controls Company: *See—*
Barr, Kenneth W., 4,178,525, Cl. 310-319.000.
Brakebill, Harold G.; and Dexter, Edwin M., 4,177,924, Cl. 236-86.000.
Robins, Milton, to PTI - Dolco. Narrow clearance gate latch. 4,178,025, Cl. 292-117.000.
Rockwell International Corporation: *See—*
Nichols, Richard A., 4,178,559, Cl. 330-296.000.
Roebuck, Peter; and Petch, James H. T., to Magnesium Elektron Limited. Stirring means to make magnesium alloys. 4,178,177, Cl. 75-135.000.
Roesch, Carol; and Heinimann, Rene. Inertial electric switch. 4,178,492, Cl. 200-61.45R.
Rogers, Philip J., to Pilkington P. E. Limited. Optical systems. 4,178,072, Cl. 350-145.000.
Rogers, Philip J., to Pilkington P. E. Limited. Lenses with distortion. 4,178,075, Cl. 350-175.0FS.
Rohm and Haas Company: *See—*
Emmons, William D.; and Nyi, Kayson, 4,178,425, Cl. 528-73.000.
Meisinger, Robert H.; and Yu, Pyung K., 4,178,169, Cl. 71-98.000.
Russell, Larry M., 4,178,406, Cl. 428-283.000.
Rohren, Ronald E.: *See—*
Peiler, Rolf W.; and Rohren, Ronald E., 4,177,821, Cl. 130-27.00T.
Rohringer, Peter: *See—*
Nachbur, Hermann; and Rohringer, Peter, 4,178,398, Cl. 427-379.000.
Rojo, Agustin, Jr. Manufacture of precast concrete units and a building constructed therewith. 4,178,343, Cl. 264-333.000.
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., to United States of America, Navy. Quick response humidity chamber. 4,177,667, Cl. 73-1.00G.
Rolls-Royce Limited: *See—*
Jenkinson, John, 4,178,129, Cl. 416-95.000.
Pask, George, 4,177,637, Cl. 60-39.360.
Taylor, Maurice I., 4,177,639, Cl. 60-226.00A.
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, to Rheinmetall GmbH. Spin stabilized projectile assembly. 4,177,733, Cl. 102-93.000.
Ronneberger, Hansjorg: *See—*
Heimburger, Norbert; Ronneberger, Hansjorg; and Schick, Manfred, 4,178,368, Cl. 424-94.000.
Rooney, Clarence S.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Roos, Ernst: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.
Rose, Donald K., to Hewlett-Packard Company. Planar and near planar magnetic bubble circuits. 4,178,635, Cl. 365-19.000.
Ross, Phillip J., to General Motors Corporation. Torque converter and lock-up clutch. 4,177,885, Cl. 192-3.300.
Rossetti, Alfio: *See—*
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500.
Roth, Walter; and Woitschatzke, Hans, to Trak Incorporated. Ski with three-dimensional running surface. 4,178,012, Cl. 280-609.000.
Rothlisberger, Henri. Light synthetic fuel. 4,178,154, Cl. 44-53.000.
Roto-Finish Company, Inc.: *See—*
Balz, Gunther W., 4,177,608, Cl. 51-163.200.
Rountree, Jean. Roll-up place mat. 4,177,846, Cl. 150-52.00C.
Rovnyak, George C., to E. R. Squibb & Sons, Inc. Substituted pyrano[4,3-c]pyrazoles, compositions containing same, and method of use. 4,178,379, Cl. 424-273.00P.
Rowe, Neal E.: *See—*
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., 4,178,624, Cl. 361-341.000.
Rowland-Hill, Edward W., to Sperry Rand Corporation. Combine with offset rotor. 4,177,820, Cl. 130-27.00T.
Rowlett, Robert P., to Northrop Corporation. Radar augmentation system for airborne target. 4,178,596, Cl. 343-18.00E.
Rowsell, David G.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.
Roy E. Roth Company: *See—*
Sieghartner, Leonard J., 4,178,131, Cl. 416-175.000.
Royer, Michel E.: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.
Rubens, Harry E. Absorbent fibrous towel. 4,178,407, Cl. 428-284.000.
Rubens, Wolfgang: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Rubey, Ulyss R., to Detectors, Inc. Method of forming a device for showing receipt of predetermined shock. 4,177,751, Cl. 116-201.000.
Ruch, Anne-Marie P.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.
Ruck Engineering, Inc.: *See—*
Ruck, Mildred R., 4,177,592, Cl. 40-426.000.
Ruck, Mildred R., to Ruck Engineering, Inc. Miniature animated display. 4,177,592, Cl. 40-426.000.
Rucker, Jimmy. Art of shaving. 4,178,364, Cl. 424-73.000.
Rudner, Bernard; Reich, David; and Galica, Edward, to Tenneco Chemicals, Inc. Manufacture of rigidized convoluted foam from flexible polyurethane foam and resultant product. 4,178,161, Cl. 55-524.000.
Rusch, Larry P.: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,178,355, Cl. 423-308.000.
Rush, Kim E., to Khartli, Inc. Wheel attached balancing device. 4,178,041, Cl. 301-5.0BA.
Russ, Paul E., Sr., to Gates Rubber Company, The. V-belt. 4,177,687, Cl. 74-231.00C.
Russell, Homer C.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Russell, Larry M., to Rohm and Haas Company. Three-layered fiberglass construction. 4,178,406, Cl. 428-283.000.
Rusznyak, Andreas, to Ebauches S.A. Binary frequency divider stages. 4,178,520, Cl. 307-255.00C.
Ruthel, Walter W.; and Evans, Leo G., to Hooker Chemicals & Plastics Corp. Cathode busbar structure. 4,178,225, Cl. 204-279.000.
Ruzicka, Jaromir; and Hansen, Elo H., to Bifok AB. Sample supply to automatic analyzers. 4,177,677, Cl. 73-422.0GC.
Rydin, Carl N. Car impact cushioning and coupler centering arrangement for railroad track bumping posts. 4,177,735, Cl. 104-254.000.
Ryzhkov, Vadim A.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.
S. T. Dupont: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.
Saboe, Michael S.: *See—*
Ivanko, Theodore; and Saboe, Michael S., 4,177,693, Cl. 74-661.000.
Sage, Donald B.; and Krautz, Fred G., to Owens-Corning Fiberglas Corporation. Glass size compositions and glass fibers coated therewith. 4,178,412, Cl. 428-391.000.
Sahagun-Barragan, Jaime. Improvements in integral drip irrigation system. 4,177,946, Cl. 239-533.100.
Sai, Fumio: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.
Sakaguchi, Shinji: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, to Toyo Soda Manufacturing Co., Ltd. Process for producing methacrylic acid. 4,178,464, Cl. 562-535.000.
Sakurai, Hiroshi. Safety knife. 4,177,560, Cl. 30-160.000.
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Mask blank and mask. 4,178,403, Cl. 428-209.000.
Salomon, Georges P. J., to S.A. des Etablissements Francois Salomon & Fils. Binding with vertical pivot axes. 4,178,014, Cl. 280-629.000.
Salomon, Robert E.; and Harding, Susan M., to Temple University. Process for conversion of ocean wave energy into electric power and apparatus. 4,178,517, Cl. 290-53.000.
Saltzman, Philip A.: *See—*
Dorsen, Mac; and Saltzman, Philip A., 4,177,587, Cl. 40-16.000.
Salvarezza, Robert M. Rope ladder. 4,177,878, Cl. 182-199.000.
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., to CUV "Progress". Apparatus for planetary feeding of electrode wire. 4,177,912, Cl. 226-176.000.
Sanders Associates, Inc.: *See—*
Johnson, Richard A., 4,178,567, Cl. 331-177.00R.
Sanders, Carlos L.: *See—*
Gebhardt, James L.; and Sanders, Carlos L., 4,177,588, Cl. 40-16.400.
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., to Bio-Dynamics Inc. Weight-measuring and display device. 4,177,868, Cl. 177-211.000.
Sandoz Ltd.: *See—*
Rissi, Erwin; and Ebnother, Anton, 4,178,377, Cl. 424-267.000.

Sangamo Weston, Inc.: *See—*
Hart, David G.; and Venaas, Norman B., 4,177,922, Cl. 235-144.0MA.

Sanki Engineering Ltd.: *See—*
Nunogaki, Yoshiaki, 4,178,152, Cl. 23-230.00B.

Sano, Fukuzi: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Sano, Shoichi: *See—*
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.

Sansanelli, Edward: *See—*
Streit, Allan L.; and Sansanelli, Edward, 4,178,264, Cl. 252-316.000.

Santal Equipamentos S. A. Comercio E. Industria: *See—*
Ribeiro Pinto, Luiz Antonio C., 4,177,953, Cl. 241-58.000.

Santana, Miguel E. Remote microphone with approved channel selector. 4,178,547, Cl. 325-16.000.

Santhanam, P.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Sapru, Krishna: *See—*
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,178,415, Cl. 428-446.000.

Sara, George M., to Beach Manufacturing Corporation. Automatic lithographic plate processor. 4,178,097, Cl. 355-100.000.

Sarantakis, Dimitrios, to American Home Products Corporation. Octapeptides. 4,178,284, Cl. 260-112.50R.

Sarnecki, Wilhelm: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

Sarvanne, Hannu: *See—*
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.

Sarver, Douglas R. Wire straightener die. 4,177,843, Cl. 140-147.000.

Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, to Hitachi, Ltd. Phase difference detector. 4,178,554, Cl. 328-133.000.

Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole derivatives and their use as plant protection agents. 4,178,166, Cl. 71-92.000.

Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, to Dainippon Ink & Chemicals, Inc. Nematic liquid crystalline compounds. 4,178,302, Cl. 260-455.00R.

Sato, Masaaki, to Olympus Optical Company Ltd. Telephone Recorder mechanical actuator. 4,178,477, Cl. 179-6.00R.

Sauer, Donald J., to RCA Corporation. Readout of a densely packed CCD. 4,178,614, Cl. 358-213.000.

Sauer, Gerhard: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.

Sauer, Heinrich, to Siemens Aktiengesellschaft. Pushbutton switch with collar. 4,178,493, Cl. 200-159.00R.

Sautiere, Bernard E.: *See—*
Duchateau, Jean L.; and Sautiere, Bernard E., 4,177,855, Cl. 164-82.000.

Sawyer, George M. Interference film photography. 4,178,181, Cl. 96-67.000.

Scarlet, Ted. Pennant and method of making a pennant. 4,177,750, Cl. 116-173.000.

Schaffitz, Wolfgang; and Huber, Eugen W., deceased (by Huber-Patzold, Gerda A. O., Anke H. L. Huber, Christina G. E. Huber, heirs), to Institut fur Motorenbau Professor Huber Eingetragener Verein. Fuel injection nozzle for internal combustion engines with internal mixing. 4,177,948, Cl. 239-533.300.

Schaffter, Craig D.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., 4,178,479, Cl. 179-15.0BY.

Scharbach, Heinz: *See—*
Grell, Helmut; and Scharbach, Heinz, 4,177,524, Cl. 3-1.900.

Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. 16,16-Spirocycloalkyl prostaglandin derivatives. 4,178,461, Cl. 562-463.000.

Scheepswerf en Machinefabriek "De Liesbosch" B.V.: *See—*
de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., 4,177,585, Cl. 37-67.000.

Scheffer, Karl D. Catalyst for curing resins. 4,178,429, Cl. 525-398.000.

Schering, Aktiengesellschaft: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.

Schering Corporation: *See—*
Daniels, Peter J. L.; and Varchei, Mohammed M. N., 4,178,453, Cl. 548-369.000.

Scheying, Heinz, to Daimler-Benz Aktiengesellschaft. Fuel injection pump for air-compressing injection internal combustion engines. 4,178,141, Cl. 417-498.000.

Schick, Manfred: *See—*
Heimburger, Norbert; Ronneberger, Hansjorg; and Schick, Manfred, 4,178,368, Cl. 424-94.000.

Schiek, Burkhard; and Kohler, Jurgen, to U.S. Philips Corporation. Micro-slot-stripline phase shifter. 4,178,570, Cl. 333-161.000.

Schlensker, Albert L.: *See—*
Curtis, Russell R.; and Schlensker, Albert L., 4,177,949, Cl. 239-582.000.
Stevens, Robert E.; and Schlensker, Albert L., 4,177,937, Cl. 222-63.000.

Schluckebier, Floyd A., to General Motors Corporation. Torsion bar for power steering gear. 4,177,714, Cl. 91-375.00A.

Schmelzer Corporation: *See—*
Benjamin, Benjamin C., 4,177,831, Cl. 137-513.500.

Schmidt, Daniel R., Jr.; and Busse, Joseph F., to Andrew Corporation. Feed system for microwave antenna employing pattern control elements. 4,178,576, Cl. 343-781.00R.

Schmidt, David A.: *See—*
Stevenson, Donald R.; and Schmidt, David A., 4,178,326, Cl. 525-176.000.

Schmidt, Klaus, to EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft. Portable grilling device. 4,177,720, Cl. 99-419.000.

Schmidt, Robert R.: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,178,166, Cl. 71-92.000.

Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, to Bayer Aktiengeselschaft. Dental filling material. 4,177,563, Cl. 433-228.000.

Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal N-(haloacetyl)-N-(N'-methylenepyrrolidonyl)-2-alkoxyanilines useful as herbicides. 4,178,167, Cl. 71-95.000.

Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal n-(haloacetyl)-n-(n-methylene pyrrolidonyl)-2-oxyalkyleneoxyalkylanilines. 4,178,168, Cl. 71-95.000.

Schnell, Philip G.: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.

Schnitzer, Arthur P.: *See—*
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.

Schoenfield, Palmer J.: *See—*
Meyer, Burton C.; and Schoenfield, Palmer J., 4,177,991, Cl. 273-95.00B.

Schoening, Peter K.: *See—*
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 4,177,758, Cl. 119-3.000.

Schonherr, Klaus P. Bistable device for representation of a point of a tactile information. 4,178,586, Cl. 340-407.000.

Schossler, Willi; Behre, Horst; and Putter, Rolf, to Bayer Aktiengesellschaft. Process for the preparation of 1-amino-8-naphthol-3,6-disulphonic acid (H-acid). 4,178,308, Cl. 260-509.000.

Schreiber, Ronald S.: *See—*
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., 4,178,255, Cl. 252-8.800.

Schriber, Louis; Stephens, Robert E.; and Blaha, John F., to Harris Corporation. Method and apparatus for web printing. 4,177,730, Cl. 101-248.000.

Schroeder, Gregory D.: *See—*
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.

Schudel, Marcus T. Lamp. 4,178,625, Cl. 362-131.000.

Schulein, Rolf G.: *See—*
Liebscher, Johannes; and Schulein, Rolf G., 4,177,533, Cl. 15-42.000.

Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing 1,1-difluoroethylene from acetylene. 4,178,316, Cl. 260-653.500.

Schultz, Robert T. Triggering device responsive to energy flow and controlled solar heating system incorporating the device. 4,177,795, Cl. 126-271.000.

Schulz, Hans-Hermann: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Schulz, Siegfried, to Christoph, Dieter, a part interest. Steady rest for use in apparatus for supporting and precision-turning of large rotary devices. 4,177,701, Cl. 82-39.000.

Schulze, Heinz: *See—*
Waddill, Harold G.; and Schulze, Heinz, 4,178,427, Cl. 528-124.000.

Schurle, Herman: *See—*
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.

Schurmann, Heinz P. Cold flow forming. 4,177,665, Cl. 72-359.000.

Schwartz, Charles M.; and Meierhoefer, Eugene J., to Warner-Lambert Company. Humidifier unit. 4,177,945, Cl. 239-338.000.

Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for isolating dinitrogen monoxide. 4,177,645, Cl. 62-23.000.

Schwarz, Manfred: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.

Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, to Mannesmann Aktiengesellschaft. Method and apparatus for bending large pipes. 4,177,661, Cl. 72-128.000.

Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Double-cylinder pump especially for conveying cement. 4,178,142, Cl. 417-516.000.

Sci-Med Life Systems, Inc.: *See—*
Torgeson, William L., 4,177,816, Cl. 128-400.000.

SCI Systems, Inc.: *See*—
King, Olin B., 4,178,583, Cl. 346-163.000.
King, Olin B., 4,178,599, Cl. 346-163.000.
King, Olin B., 4,178,600, Cl. 346-163.000.
King, Olin B., 4,178,601, Cl. 346-163.000.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C8 modifications. 4,178,436, Cl. 536-9.000.

Sciortino, August M. Self-locking coin receptacle and cover therefor. 4,177,920, Cl. 232-16.000.

Scott, John W.: *See*—
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.

Scott Paper Company: *See*—
Wheatland, David A., 4,178,179, Cl. 96-33.000.

Seabrook, Inc.: *See*—
Kennedy, Harry R., 4,177,629, Cl. 57-1.00R.

Seakan, Raymond N., to Acro-Fab Industries, Inc. Bicycle cable. 4,177,541, Cl. 24-73.00A.

Seaman, Jack L.: *See*—
Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., 4,178,332, Cl. 261-50.00R.

Searle, Harold L.: *See*—
Kellett, Harry; and Searle, Harold L., 4,177,887, Cl. 192-8.00R.

Seifert, Horst: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000.

Seigal, Steven D.: *See*—
Champion, James R.; and Seigal, Steven D., 4,178,095, Cl. 355-14.00R.

Seiler, Hartmut; and Kugelmann, Adolf, to Robert Bosch GmbH. Protective integrated circuit network, particularly for connection to an inductive load. 4,178,619, Cl. 361-91.000.

Sekiguchi, Tomoyoshi; and Fujii, Masayuki, to Nissan Motor Company, Limited. Hydropneumatic suspension unit with a level selector mechanism. 4,177,977, Cl. 267-64.00R.

Sekmakas, Kazys, to DeSoto, Inc. High solids coating compositions containing liquid bishydroxy ethyl ether of a bisphenol. 4,178,325, Cl. 525-157.000.

Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane and use thereof in the electrolysis of sodium chloride. 4,178,218, Cl. 204-98.000.

Senger, Stephen J., to United States of America, Navy. Angle servo preamplifier. 4,178,594, Cl. 343-7.400.

Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, to Oy E. Sarlin AB. Cistern pumping plant. 4,178,139, Cl. 417-360.000.

Serres, Pierre F.: *See*—
Grangirard, Henri; and Serres, Pierre F., 4,177,801, Cl. 128-2.05M.

Shell Oil Company: *See*—
Carr, John B., 4,178,380, Cl. 424-283.000.

Shelton, Marcus H. Moisture stabilized package. 4,177,895, Cl. 206-386.000.

Shenk, Edwin K.; and Tam, Shirley Y., to Polaroid Corporation. Autofocus movie camera having focus correction means. 4,178,087, Cl. 354-195.000.

Shepard, Francis H., Jr., to R & I Patent Corporation. Switching type regulated power supply. 4,178,628, Cl. 363-25.000.

Shepherd, Charles E. Hanger assembly for fill strips. 4,178,333, Cl. 261-111.000.

Shiba, Masataka: *See*—
Funakubo, Hiroyasu; and Shiba, Masataka, 4,178,472, Cl. 179-1.0SD.

Shibuya, Morioki; and Isa, Isao, to Japan Carlit Co., Ltd., The. Process for manufacturing chlorine dioxide. 4,178,356, Cl. 423-478.000.

Shigematsu, Syozo. Surface coating device of bamboos. 4,177,756, Cl. 118-404.000.

Shimizu, Masahiko: *See*—
Shinoda, Akibumi; and Shimizu, Masahiko, 4,178,004, Cl. 280-5.00A.

Shimizu, Masami: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.

Shimoji, Katsuichi: *See*—
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, to Dainippon Screen Seizo Kabushiki Kaisha. Aperture plate for an exposure head for use in a picture scanning reproducer. 4,178,615, Cl. 358-302.000.

Shinoda, Akibumi; and Shimizu, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Spare fuel tank for vehicle use. 4,178,004, Cl. 280-5.00A.

Shioya, Makoto: *See*—
Shiraishi, Atsuko; and Shioya, Makoto, 4,178,132, Cl. 417-5.000.

Shiraishi, Atsuko; and Shioya, Makoto, to Hitachi, Ltd. Method and device for controlling the number of pumps to be operated. 4,178,132, Cl. 417-5.000.

Shiraishi, Hideo: *See*—
Tatsutomi, Yasuo; Shiraishi, Hideo; and Hamamoto, Takashi, 4,177,784, Cl. 123-179.00G.

Shirato, Keiji, to Sony Corporation. Contrast/color control for a television receiver. 4,178,608, Cl. 358-21.00R.

Shiratori, Harunori: *See*—
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, 4,177,671, Cl. 73-146.500.

Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V. Culture medium for cultivation of fodder yeasts. 4,178,214, Cl. 195-100.000.

Shmit, Uldis Y.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, to Nitto Boseki Co., Ltd. Bushing for apparatus for spinning glass fibers. 4,178,162, Cl. 65-1.000.

Shouda, Makoto: *See*—
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.

Shoup, Thomas E.: *See*—
Spisak, Steve; and Shoup, Thomas E., 4,178,495, Cl. 219-98.000.

Shue, Robert S.; and Crain, Donald L., to Phillips Petroleum Company. Mold corrosion inhibition. 4,178,276, Cl. 260-37.00R.

Siden, LeRoy E.: *See*—
Hujsak, Edward J.; and Siden, LeRoy E., 4,177,964, Cl. 244-161.000.

Sidorenko, Valery A.: *See*—
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V., 4,177,699, Cl. 82-1.00C.

Sieber-Muller, Paul. Flow control device. 4,177,969, Cl. 251-9.000.

Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., to Weldotron Corporation. Bag sealing apparatus with bag evacuation means. 4,177,622, Cl. 53-511.000.

Sieghartner, Leonard J., to Roy E. Roth Company. Centrifugal impellers. 4,178,131, Cl. 416-175.000.

Siemens Aktiengesellschaft: *See*—
Denk, Hans; and Reeh, Ulrike, 4,178,274, Cl. 260-31.80E.
Muendel, Gerald, 4,178,603, Cl. 357-15.000.
Sauer, Heinrich, 4,178,493, Cl. 200-159.00R.
Soldner, Richard E., 4,177,679, Cl. 73-625.000.
Wossler, Manfred, 4,177,983, Cl. 271-268.000.

Signetics Corporation: *See*—
Yu, Steve K., 4,178,620, Cl. 361-98.000.

Sikula, William J., Jr., to Deere & Company. Filter wrench. 4,177,529, Cl. 7-100.000.

Silver, Alexander; and Wenban, James R., to Garrett Corporation, The. Foil bearing. 4,178,046, Cl. 308-9.000.

Silverberg, Morton, to Xerox Corporation. Belt support and steering module. 4,178,094, Cl. 355-16.000.

Silverman, Gordon: *See*—
Pinz, Rochelle; and Silverman, Gordon, 4,177,708, Cl. 84-1.280.

Sim, James S. Y.: *See*—
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.

Simmons, Thomas R. Apparatus for shaping and positioning fluid dispersal patterns. 4,177,927, Cl. 239-101.000.

Simon, Sydney. Safety liquid dispenser. 4,177,863, Cl. 169-62.000.

Simonelic, Joseph J.; and Ho, Roland K., to Motorola, Inc. Electromechanical pressure transducer. 4,178,621, Cl. 361-283.000.

Singer Company, The: *See*—
Adams, Kenneth D.; and Brauch, Robert B., 4,177,745, Cl. 112-221.000.
Du Bois, Edward F.; and Papastrat, Arthur L., 4,177,666, Cl. 72-420.000.
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.
Wurst, John W.; and Dunn, William H., 4,177,744, Cl. 112-158.00E.

Singh, Vijay P.: *See*—
Jordan, John F.; and Singh, Vijay P., 4,178,395, Cl. 427-74.000.

Sinker, Stephen M.: *See*—
Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., 4,178,337, Cl. 264-28.000.

Sinkhorn, William A. Security door lock. 4,178,026, Cl. 292-295.000.

Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., to Kearney & Trecker Corporation. Machine tool with hollow structural steel members. 4,177,550, Cl. 29-568.000.

Siragusa, George A.: *See*—
Marshall, Albert H.; and Siragusa, George A., 4,177,580, Cl. 35-25.000.

Sitton, Willard J.: *See*—
Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., 4,177,998, Cl. 277-59.000.

Sivak, Elmer: *See*—
Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, 4,178,421, Cl. 525-4.000.

Skagerlund, Lars-Erik, to Aktiebolaget Bofors. Device for determining the direction towards a remote object. 4,178,505, Cl. 250-203.00R.

SKF Compagnie d'Applications Mechaniques: *See*—
Thomas, Georges; and Nicol, Henri, 4,178,202, Cl. 159-15.000.

Skil Corporation: *See*—
Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., 4,177,609, Cl. 51-170.0EB.

Skuba, Thadeus: *See*—
Bowe, Gerald J.; and Skuba, Thadeus, 4,177,716, Cl. 98-115.0SB.

Slater, Paul, to Delta Plastics Limited. Liquid flow sensing device. 4,177,760, Cl. 119-14.080.
Slonczewski, John C.: *See—*
Argyle, Bernell E.; Slonczewski, John C.; and Dekker, Pieter, 4,178,636, Cl. 365-30.000.
Slysh, Roman S.: *See—*
Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., 4,178,067, Cl. 350-96.210.
Smith, Bernie B., Jr. Pipeline blow down technique. 4,178,155, Cl. 48-191.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Method and apparatus for coal separation using fluorinated hydrocarbons. 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Fluorinated hydrocarbons in coal mining and beneficiation. 4,178,233, Cl. 209-3.000.
Smith, Edward B.: *See—*
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., to Conoco, Inc. Sulfur plant heatup process. 4,178,358, Cl. 423-574.00R.
Smith, Gerald B.: *See—*
Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., 4,178,489, Cl. 179-100.40C.
Smith, Harry A., to Dow Chemical Company, The. Process for making arylene sulfide polymers. 4,178,433, Cl. 528-381.000.
Smith International, Inc.: *See—*
Neilson, William J., 4,178,045, Cl. 308-8.200.
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., to Pipe Line Development Co., The. Pipe plugging device. 4,177,827, Cl. 137-318.000.
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., to General Motors Corporation. Method and apparatus for reversing and flattening a driver's restraint cushion. 4,178,344, Cl. 264-572.000.
Smith, William B.: *See—*
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.
Smith, William J., to Westinghouse Electric Corp. Control for a power plant coal mill pulverizer having feedforward damper positioning. 4,177,950, Cl. 241-33.000.
SmithKline Corporation: *See—*
Berges, David A., 4,178,288, Cl. 548-251.000.
Snamprogetti, S.p.A.: *See—*
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, 4,177,859, Cl. 165-11.000.
SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Mattone, Roberto; and Catoni, Mario, 4,178,287, Cl. 260-239.30A.
Snowden, Paul, to Imperial Chemical Industries Limited. Production of fibres. 4,178.336, Cl. 264-8.000.
Snyder, Paul V., to General Electric Company. Electric toaster control. 4,178,498, Cl. 219-413.000.
Societe Anonyme Automobiles Citroen: *See—*
Lachaize, Henri G., 4,177,694, Cl. 74-732.000.
S.A. des Etablissements Francois Salomon & Fils: *See—*
Salomon, Georges P. J., 4,178,014, Cl. 280-629.000.
Societe Civile G. M. Maheo - Conseil: *See—*
Maheo, Guy, 4,177,759, Cl. 119-4.000.
Societe d'Usinage des Tubes pour l'Electricite S.U.T.E.: *See—*
Aubert, Rene, 4,177,547, Cl. 29-432.000.
Societe Legris France S.A.: *See—*
Legris, Andre, 4,177,972, Cl. 251-288.000.
Sodickson, Lester A., to Damon Corporation. Method and apparatus for chemical spot test analysis. 4,178,153, Cl. 23-230.00R.
Solar Suede Corporation: *See—*
McHugh, John P., 4,177,940, Cl. 222-636.000.
Soldner, Richard E., to Siemens Aktiengesellschaft. Ultrasonic applicator for ultrasonic scanning of bodies and method of using the same. 4,177,679, Cl. 73-625.000.
Sollich, Helmut, to Sollich KG Spezialmaschinenfabrik. Apparatus for controlling the temperature of flowable chocolate materials. 4,178,105, Cl. 366-312.000.
Sollich KG Spezialmaschinenfabrik: *See—*
Sollich, Helmut, 4,178,105, Cl. 366-312.000.
Solomon, Victor C., to Eastman Kodak Company. Horizontal film processing apparatus. 4,178,091, Cl. 354-322.000.
Sontgerath, Hilde: *See—*
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.
Sony Corporation: *See—*
Shirato, Keiji, 4,178,608, Cl. 358-21.00R.
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, 4,177,872, Cl. 181-144.000.
Soto, Ricardo H. Disposable, resealable container. 4,177,919, Cl. 229-54.00R.
Sparks, Gregory E.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Spector, George: *See—*
Crosby, Bruce R.; and Spector, George, 4,177,993, Cl. 273-160.000.
Papistas-Scherer, Bertha; and Spector, George, 4,177,803, Cl. 128-25.00B.
Spence-Bate, Harry A. H. Photographic developer. 4,178,089, Cl. 354-319.000.
Sperry Rand Corporation: *See—*
Knight, Andrew C.; and Meek, Nigel W., 4,177,625, Cl. 56-13.600.
Rowland-Hill, Edward W., 4,177,820, Cl. 130-27.00T.
Speth, William R., to International Telephone and Telegraph Corporation. Base drive circuit. 4,178,521, Cl. 307-270.000.
Spindler, Stanley G. Slip-on guitar cover. 4,177,847, Cl. 150-52.00R.
Spisak, Steve; and Shoup, Thomas E., to TRW, Inc. Apparatus for welding studs to workpieces. 4,178,495, Cl. 219-98.000.
Spors, Howard P. Combined blank forming and bending tool. 4,177,664, Cl. 72-326.000.
Sprecker, Mark A.; and Theimer, Ernst T., to International Flavors & Fragrances Inc. Process for the production of compounds useful in perfumery. 4,178,311, Cl. 260-592.000.
Spring, David J.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.
Square D Company: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.
Khalid, Joseph M., 4,178,618, Cl. 361-58.000.
Stamicarbon, B.V.: *See—*
van den Berg, Cornelis E. P. V., 4,178,300, Cl. 260-413.000.
Standard Oil Company a corporation of Indiana: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.
Standard Oil Company (Indiana): *See—*
Tee, Liong S.; and Reindl, John C., 4,178,435, Cl. 528-501.000.
Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, 4,178,421, Cl. 525-4.000.
Stanley, John M.; and Greene, Bernard A., to AMSTED Industries Incorporated. Pipe coupling. 4,178,001, Cl. 277-152.000.
Stanley Works, Limited, The: *See—*
Lambertz, Martin R., 4,177,545, Cl. 29-11.000.
Stant Manufacturing Company, Inc.: *See—*
Evans, John H., 4,177,931, Cl. 220-288.000.
Staprans, Ilona: *See—*
Felts, James M.; and Staprans, Ilona, 4,178,285, Cl. 260-112.00R.
Stauffer Chemical Company: *See—*
Anderson, Donald F.; and Yu, Arthur J., 4,178,423, Cl. 526-240.000.
Reale, Michael J., 4,178,420, Cl. 521-107.000.
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, to BASF Aktiengesellschaft. Manufacture of acicular ferromagnetic iron particles. 4,178,171, Cl. 75-0.5AA.
Steele, Daniel, to Imperial Chemical Industries Limited. Explosive fuse-cord. 4,177,732, Cl. 102-27.00R.
Stefani, Giancarlo; and Fontana, Pietro, to Lonza, Ltd. Process for preparing maleic anhydride. 4,178,298, Cl. 260-346.750.
Stein, Werner: *See—*
Franz, Arnold; and Stein, Werner, 4,178,408, Cl. 428-285.000.
Steingrover, Horst, to C. Keller GmbH u. Co. KG. Device for the formation of separated rows of green bricks. 4,177,890, Cl. 198-434.000.
Stephens, Robert E.: *See—*
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,177,730, Cl. 101-248.000.
Sterling Drug Inc.: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,178,375, Cl. 424-248.400.
Stevens, Robert E.; and Schlensker, Albert L., to Curtis Dyna Products Corporation. Constant pressure spraying apparatus. 4,177,937, Cl. 222-63.000.
Stevenson, Donald R.; and Schmidt, David A., to Owens-Corning Fiberglas Corporation. Low-shrink thermosetting polyesters. 4,178,326, Cl. 525-176.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. System and method for improving the reaction efficiency of a fluidized bed. 4,177,741, Cl. 110-263.000.
Steyn, Jan: *See—*
de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., 4,177,585, Cl. 37-67.000.
Stieger, Frank: *See—*
Gordon, Michael E.; and Stieger, Frank, 4,177,552, Cl. 29-623.400.
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., to Colgate-Palmolive Company. Detergent compositions. 4,178,255, Cl. 252-8.800.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C. Stripping sulphur compounds from stack and other discharge gases and the commercial products derived therefrom. 4,178,357, Cl. 423-522.000.
Stokes, Gary P.: *See—*
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,199, Cl. 156-110.00R.
Streit, Allan L.; and Sansanelli, Edward, to Airwick Industries, Inc. Air treating gel composition. 4,178,264, Cl. 252-316.000.
Streit, Werner: *See—*
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, 4,178,217, Cl. 204-55.00Y.
Strunk, Richard J.: *See—*
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000.
Stupell Industries, Inc.: *See—*
Dorsen, Mac; and Saltzman, Philip A., 4,177,587, Cl. 40-16.000.
Subramanian, Nagaraja: *See—*
Lake, Don W.; and Subramanian, Nagaraja, 4,178,487, Cl. 179-90.0BD.

Suetake, Yoshinori: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.
Suling, Carlhans: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.
Sullivan, Thomas E.; and Wright, Oscar L. Method of removing urea and/or creatinine. 4,178,241, Cl. 210-24.000.
Sumikin Coke Company Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sumitomo Chemical Company, Limited: *See—*
Yasui, Seimei; and Hino, Minoru, 4,178,186, Cl. 106-20.000.
Sumitomo Metal Industries Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sumiyoshi, Masaharu: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Sun, Joseph Z.: *See—*
Weinberg, Alan S.; and Sun, Joseph Z., 4,178,401, Cl. 428-35.000.
Sunami, Yoshihiko: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sundeen, Arthur R., to General Motors Corporation. Diesel engine glow plug energization control device. 4,177,785, Cl. 123-179.00H.
Sunflower Manufacturing Company, Inc.: *See—*
Worick, Richard A., 4,178,009, Cl. 280-411.00A.
Superior Electric Company, The: *See—*
Crapo, Roland L., 4,178,539, Cl. 323-45.000.
Surland, Charles C. Golf practice device. 4,177,995, Cl. 273-199.00A.
Suzuki, Hiroyuki, to Daishin Kako Co., Ltd. Refractory releasing agent. 4,177,943, Cl. 222-591.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Photographic camera with a release locking device. 4,178,085, Cl. 354-60.00R.
Suzuki, Yutaka: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Svinin, Mikhail P.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Swait, John C.: *See—*
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.
Swanson, Wesley S., to Eaton Corporation. Electrically operated device and valving mechanism employing same. 4,178,573, Cl. 335-255.000.
Sweet, Charles S., to Merck & Co., Inc. Novel pharmaceutical compositions of β-blockers with diuretics. 4,178,374, Cl. 424-246.000.
Swenson, John H. Test probe for telephone wire connector. 4,178,058, Cl. 339-108.0TP.
Swenson, Richard C., to United States of America, Navy. Buoy system for vertical ocean profiling. 4,177,530, Cl. 9-8.00R.
Swingline, Inc.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.
Swoager, James M.: *See—*
Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., 4,177,567, Cl. 33-23.00K.
Swoager, Jon R.: *See—*
Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., 4,177,567, Cl. 33-23.00K.
Sybron Corporation: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.
Sykes, Alec, to David Brown Tractors Limited. Variable-track wheels. 4,178,042, Cl. 301-9.0TV.
Syntex (U.S.A.) Inc.: *See—*
Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., 4,178,457, Cl. 560-53.000.
Szauer, Jorge S.: *See—*
Baylis, Shelby M.; and Szauer, Jorge S., 4,177,797, Cl. 128-2.00B.
Szenger, Franz: *See—*
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl. 33-174.00L.
Tabata, Yasuhiro: *See—*
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, 4,178,093, Cl. 355-8.000.
Tabler, Charles P., to Kornylak Corporation. Molding conveyor drive. 4,178,144, Cl. 425-150.000.
Tachikawa, Katsuziro: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing dye-fading inhibitors. 4,178,184, Cl. 96-74.000.
Takada, Syun: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,178,184, Cl. 96-74.000.
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, to Hitachi, Ltd. Analog-to-digital converter. 4,178,585, Cl. 340-347.0NT.
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, to Fuso Keigokin Co., Ltd. Cord winding apparatus. 4,177,963, Cl. 242-107.110.
Takahashi, Kotei: *See—*
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,177,886, Cl. 192-4.00A.
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, to Nippon Electric Co., Ltd. Television picture special effects system using digital memory techniques. 4,178,613, Cl. 358-183.000.
Takahashi, Sankichi: *See—*
Nakaoka, Azuma; and Takahashi, Sankichi, 4,178,245, Cl. 210-81.000.
Takano, Tadayoshi; and Horibe, Susumu, to Fujisawa Pharmaceutical Co., Ltd. 7-(α-Substituted glycinamido)-3-substituted methyl-3-cephem-4-carboxylic acids and their derivatives. 4,178,445, Cl. 544-30.000.
Takasago Thermal Engineering Co., Ltd.: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.
Takatsu, Haruyoshi: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.
Takeda, Yosiaki: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Takeuchi, Seiji: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Takishima, Yoshiyuki: *See—*
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
Tam, Shirley Y.: *See—*
Shenk, Edwin K.; and Tam, Shirley Y., 4,178,087, Cl. 354-195.000.
Tanaka, Takehisa: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.
Tanida, Masao: *See—*
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, 4,177,586, Cl. 40-2.00R.
Taniguchi, Nobuyuki: *See—*
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, 4,178,464, Cl. 562-535.000.
Tankred, Hans J., to Danfoss A/S. Compressor with reciprocating piston particularly for small refrigerators. 4,178,140, Cl. 417-415.000.
Tarasevich, Andrew, to Lockheed Electronics Co., Inc. Optical signal communicating apparatus. 4,178,515, Cl. 250-551.000.
Tashiro, Koji; and Matsumoto, Yoichi, to Metallgesellschaft AG. Process and apparatus for the collection of high-resistance dust. 4,178,156, Cl. 55-5.000.
Tatsutomi, Yasuo; Shiraishi, Hideo; and Hamamoto, Takashi, to Toyo Kogyo Co., Ltd. Engine starting device. 4,177,784, Cl. 123-179.00G.
Tavano, Sergio: *See—*
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, 4,177,859, Cl. 165-11.000.
Tavkozlesi Kutato Intezet: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.
Taylor, Frank D.; and Novotny, Ronald J., to General Communications Co., Inc. Method and control apparatus for radio paging systems. 4,178,475, Cl. 179-2.0EC.
Taylor, Leonard H., to Perkin-Elmer Limited. Repetitive-cycle object handling apparatus. 4,178,121, Cl. 414-104.000.
Taylor, Maurice I., to Rolls-Royce Limited. Thrust reverser for a fluid flow propulsion engine. 4,177,639, Cl. 60-226.00A.
Taylor, Roland S.: *See—*
Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., 4,178,332, Cl. 261-50.00R.
Tazume, Masayuki: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.
Technisch Handels- en Adviesbureau van Geffen B.V.: *See—*
van Geffen, Johannes A., 4,177,659, Cl. 72-71.000.
Tee, Liong S.; and Reindl, John C., to Standard Oil Company (Indiana). Recovery process for branched polyphenylene. 4,178,435, Cl. 528-501.000.
Telec S.A.: *See—*
Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., 4,178,362, Cl. 424-48.000.
Telediffusion de France: *See—*
Pujolle, Jean, 4,177,876, Cl. 181-284.000.
Teleflex Incorporated: *See—*
Fillmore, F. Lawrence, 4,177,691, Cl. 74-501.00P.

Tellier, Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of oxaziridine. 4,178,292, Cl. 260-333.000.

Temer, Vladan. Method of reducing distortion in electronic networks. 4,178,555, Cl. 328-162.000.

Temesi nee Palmai, Maria: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.

Temple University: *See—*
Salomon, Robert E.; and Harding, Susan M., 4,178,517, Cl. 290-53.000.

Teng, Lina C., to Philip Morris, Inc. Smoking composition. 4,178,458, Cl. 560-60.000.

Tenneco Chemicals, Inc.: *See—*
Rudner, Bernard; Reich, David; and Galica, Edward, 4,178,161, Cl. 55-524.000.

Tenney, Linwood P.; and Lane, Parley C., Jr., to BF Goodrich Company, The. Cycloolefin copolymers. 4,178,424, Cl. 526-283.000.

Teradyne, Inc.: *See—*
Hoffman, Mark S., 4,178,544, Cl. 324-64.000.
Wrinn, Joseph F.; and Hoffman, Mark S., 4,178,543, Cl. 324-64.000.

Terajima, Kazuki: *See—*
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.

Terk, Harold S., to Abbott Laboratories. Cuvette cartridge. 4,178,345, Cl. 422-61.000.

Terry, Ruel C.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,178,357, Cl. 423-522.000.

Te Velde, Ties S., to U.S. Philips Corporation. Electrostatically controlled picture display device. 4,178,077, Cl. 350-285.000.

Texaco Development Corp.: *See—*
Waddill, Harold G., 4,178,426, Cl. 528-111.000.
Waddill, Harold G.; and Schulze, Heinz, 4,178,427, Cl. 528-124.000.

Texaco Inc.: *See—*
Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., 4,177,752, Cl. 166-263.000.

Texas Alkyls, Inc.: *See—*
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.

Texas Instruments Incorporated: *See—*
Dudley, Dana; and Knight, William M., Jr., 4,178,612, Cl. 358-167.000.
Porter, Vernon R., 4,178,224, Cl. 204-237.000.

Theimer, Ernst T.: *See—*
Sprecker, Mark A.; and Theimer, Ernst T., 4,178,311, Cl. 260-592.000.

Thelen, William G.; and Bein, Thomas W., to United States of America, Navy. Relative orbiting motion by synchronoously rotating scroll impellers. 4,178,143, Cl. 418-19.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for receiving and conveying ferrous rail fastening elements. 4,178,236, Cl. 209-215.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for receiving and conveying ferrous rail fastening elements. 4,178,237, Cl. 209-215.000.

Thibodeau, Robert W., Sr. Bicycle safety device. 4,178,070, Cl. 350-99.000.

Thiruvillakkat, Krishnan, to Borg-Warner Corporation. Rigid, high impact polypropylene compositions. 4,178,328, Cl. 525-98.000.

Thomas, Georges; and Nicol, Henri, to SKF Compagnie d'Applications Mechaniques. Method and apparatus for facilitating the disposal of cutting liquid. 4,178,202, Cl. 159-15.000.

Thomas, James R.: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.

Thomas, Michael B., to Pfizer Inc. 1-N-Kanamycin derivatives. 4,178,437, Cl. 536-10.000.

Thomas, Ralph H., to Bristol-Myers Company. Squeeze bottle. 4,177,939, Cl. 222-153.000.

Thomassin, Robert C. Fishing lure simulating lifelike movement. 4,177,597, Cl. 43-42.300.

Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, to Standard Oil Company (Indiana). Method for dispersing an additive into a thermoplastic resin. 4,178,421, Cl. 525-4.000.

Thompson, Geraldine E.: *See—*
Thompson, James G., 4,178,548, Cl. 325-16.000.

Thompson, James E., to Deere & Company. Disposable pressure vessel. 4,177,836, Cl. 138-30.000.

Thompson, James G., to Thompson, Geraldine E.; and Thompson, James G. Voice actuated mobile radio. 4,178,548, Cl. 325-16.000.

Thompson, John J.; Gorman, Paul D.; and Dowd, Patrick, to Pres-To-Line Corporation of America. Copy holder. 4,177,591, Cl. 40-343.000.

Thompson, Raymond D.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.

Thomson - CSF: *See—*
Croset, Michel; and Velasco, Gonzalo, 4,178,418, Cl. 429-27.000.
Ribout, Pierre; and Delory, Bernard, 4,178,533, Cl. 315-3.600.

Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., to Outokumpu Oy. Process for the production of extra fine cobalt powder. 4,178,172, Cl. 75-0.5BA.

TOA Electric Co., Ltd.: *See—*
Nishihata, Yukihiro, 4,178,488, Cl. 179-100.00L.

Tochihara, Joe I. Beauty operator wall structure. 4,177,612, Cl. 52-28.000.

Toda, Kikujiro, to Toyoda-Koki Kabushiki-Kaisha. End surface machining apparatus for a matching workpiece. 4,177,607, Cl. 51-165.00R.

Todokoro, Masatoshi. Ball fling-out structure with pivoting goals. 4,177,992, Cl. 273-101.000.

Tokico Ltd.: *See—*
Ono, Masami, 4,178,575, Cl. 340-764.000.

Tokyo Kikai Seisakusho Ltd.: *See—*
Nakagawa, Hiroshi, 4,177,960, Cl. 242-58.300.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, 4,178,396, Cl. 427-93.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,178,558, Cl. 330-11.000.

Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., to Monsanto Company. Continuous cell culture method and apparatus. 4,178,209, Cl. 195-1.800.

Tolley, William K., to UOP Inc. Recovery of iron and titanium metal values. 4,178,176, Cl. 75-101.00R.

Tomita, Mikio, to Meisei Chemical Works, Inc. Flame retardant coating composition and fabric coated therewith. 4,178,409, Cl. 428-290.000.

Tomita, Mikio, to Meisei Chemical Works, Inc. Flame retardant coating composition and fabric coated therewith. 4,178,410, Cl. 428-290.000.

Tomita, Shigeru: *See—*
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.

Toray Industries, Inc.: *See—*
Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, 4,178,454, Cl. 560-2.000.

Torgeson, William L., to Sci-Med Life Systems, Inc. Heat exchanger for blood. 4,177,816, Cl. 128-400.000.

Torkko, Reino. Animal trap. 4,177,600, Cl. 43-82.000.

Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, to Tavkozlesi Kutato Intezet. Cavity resonators with frequency-linear tuning. 4,178,562, Cl. 331-84.000.

Toro Company, The: *See—*
Hunter, Edwin J., 4,177,926, Cl. 239-99.000.

Touma, Raouf G.: *See—*
Johnson, James A.; and Touma, Raouf G., 4,178,230, Cl. 208-66.000.

Townsend Textron: *See—*
Matuschek, Josip; and Chister, Rene A., 4,177,710, Cl. 85-70.000.

Toyo Kogyo Co., Ltd.: *See—*
Tatsutomi, Yasuo; Shiraishi, Hideo; and Hamamoto, Takashi, 4,177,784, Cl. 123-179.00G.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, 4,178,464, Cl. 562-535.000.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Toda, Kikujiro, 4,177,607, Cl. 51-165.00R.

Toyota Jidosha Kobyo Kabushiki Kaisha: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, 4,177,671, Cl. 73-146.500.
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.
Wakita, Nobuaki; and Hashimoto, Eiji, 4,177,641, Cl. 60-278.000.

Tractor, Inc.: *See—*
Nelson, Robert L., Jr., 4,178,631, Cl. 364-484.000.

Trak Incorporated: *See—*
Roth, Walter; and Woitschatzke, Hans, 4,178,012, Cl. 280-609.000.

Trampert, Hans R.: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.

Trane Company, The: *See—*
Ring Jr., Harry K., 4,177,970, Cl. 251-61.300.

Tridon Limited: *See—*
Blaiklock, William M.; and Fisher, Brian A., 4,177,538, Cl. 15-250.390.

Triplex Safety Glass Company Limited: *See—*
Greenhalgh, Geoffrey, 4,178,414, Cl. 428-410.000.

Tronomed, Inc.: *See—*
Ekbom, Roger A.; and Friedlander, Sidney, 4,178,052, Cl. 339-61.00R.

TRW, Inc.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., 4,178,479, Cl. 179-15.0BY.
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-856.000.
Spisak, Steve; and Shoup, Thomas E., 4,178,495, Cl. 219-98.000.

Trzeciak, John R.: *See—*
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.

Tseitlin, Janetta M.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Tsu, Kin H.: *See*—
Fetchin, John A.; and Tsu, Kin H., 4,178,310, Cl. 260-561.00N.

Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd; and National Patent Development Corporation. Color diffusion-transfer photographic element. 4,178,182, Cl. 96-73.000.

Tsuda, Shin: *See*—
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.

Tsuji, Nobuo: *See*—
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.

Tsuji, Sadahiko; and Agari, Yujiro, to Canon Kabushiki Kaisha. Macro zoom lens. 4,178,076, Cl. 350-184.000.

Tsukada, Naonobu: *See*—
Yada, Akio; and Tsukada, Naonobu, 4,178,038, Cl. 297-391.000.

Tsukada, Toshiro: *See*—
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.

Tsunlkawa, Tokuichi: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.

Tsuruoka, Hisashi: *See*—
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.

Tsuyuguchi, Michio: *See*—
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.

Tuchnyer, Harold J.: *See*—
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.

Tudoriu, Theodor, to Falge, Peter, a part interest. Penile implantation prosthesis. 4,177,805, Cl. 128-79.000.

Turetsky, Isadore. Filter-purifier cartridge having manually separable elements. 4,178,250, Cl. 210-315.000.

Turillon, Pierre P.: *See*—
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.

Turner, George: *See*—
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.

Tushner, Lawrence P.; and Krol, Walter J., to Intercraft Industries Corporation. Picture frame assembly. 4,177,590, Cl. 40-156.000.

Ube Industries, Ltd.: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Uchida, Teiji; and Ueki, Atsufumi, to Nippon Electric Co., Ltd. Optical isolator. 4,178,073, Cl. 350-151.000.

Uchidoi, Masanori: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.

Ueda, Masahiro: *See*—
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.

Uehle, Howard T.: *See*—
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.

Ueki, Atsufumi: *See*—
Uchida, Teiji; and Ueki, Atsufumi, 4,178,073, Cl. 350-151.000.

Uemura, Kenzi: *See*—
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, 4,177,586, Cl. 40-2.00R.

Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, to Babcock-Hitachi Kabushiki Kaisha. Incinerator for burning waste and a method of utilizing same. 4,177,742, Cl. 110-346.000.

Uenoyama, Masaru: *See*—
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.

Uhlig, Richard E., to Aluminum Plumbing Fixture Corp. Latch on masquerader unit. 4,177,527, Cl. 4-3.000.

Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, to Bayer Aktiengesellschaft. Permanently stabilized polyurethanes. 4,178,279, Cl. 260-45.80N.

Umeda, Junichi: *See*—
Nakamura, Michiharu; and Umeda, Junichi, 4,178,604, Cl. 357-18.000.

Union Carbide Corporation: *See*—
Berry, Daniel D.; and Girardi, Richard V., 4,178,257, Cl. 252-21.000.
Kelly, William T., III, 4,178,538, Cl. 320-2.000.
Lowther, Frank E., 4,178,239, Cl. 210-15.000.

Union Corporation: *See*—
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.

Uniroyal, AG: *See*—
Menges, Hans G. L.; Harms, Engelbert G.; and Hegele, Rainer, 4,178,104, Cl. 366-80.000.

Uniroyal Aktiengesellschaft: *See*—
Van der Burg, Sjirk, 4,177,848, Cl. 152-158.000.

Uniroyal, Inc.: *See*—
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,199, Cl. 156-110.00R.
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Gunton, David J., 4,178,568, Cl. 333-116.000.

United States of America
Air Force: *See*—
Arnold, Fred E.; and Reinhardt, Bruce A., 4,178,428, Cl. 528-174.000.
Wess, Thomas B., 4,177,681, Cl. 74-110.000.
Army: *See*—
Bly, Vincent T., 4,178,514, Cl. 250-493.000.
Kennedy, Andrew J., 4,178,528, Cl. 313-102.000.
Kennedy , Andrew J., 4,178,529, Cl. 313-102.000.
Williams, Lowell F., 4,178,099, Cl. 356-73.000.
Energy: *See*—
Brubaker, James E., 4,178,208, Cl. 176-30.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Levis, Curt A. Distributed-switch Dicke radiometers. 4,178,100, Cl. 356-216.000.
Navy: *See*—
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.
Cini, Hector J.; and Meyers, Theodore J., 4,178,577, Cl. 367-159.000.
Marshall, Albert H.; and Siragusa, George A., 4,177,580, Cl. 35-25.000.
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., 4,177,667, Cl. 73-1.00G.
Senger, Stephen J., 4,178,594, Cl. 343-7.400.
Swenson, Richard C., 4,177,530, Cl. 9-8.00R.
Thelen, William G.; and Bein, Thomas W., 4,178,143, Cl. 418-19.000.

U.S. Philips Corporation: *See*—
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000.
Mitchell, Richard F., 4,178,571, Cl. 333-194.000.
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Schiek, Burkhard; and Kohler, Jurgen, 4,178,570, Cl. 333-161.000.
Te Velde, Ties S., 4,178,077, Cl. 350-285.000.
Wagner, Wolfgang, 4,178,510, Cl. 250-445.00T.

United Technologies Corporation: *See*—
Ferris, Donald L.; and Noehren, William L., 4,178,130, Cl. 416-107.000.
Hausmann, George F., 4,178,078, Cl. 350-319.000.
Hone, Horace T., 4,178,032, Cl. 296-19.000.
Horgan, John J., 4,177,636, Cl. 60-39.350.
Metcalfe, Robert A.; and Bourdeau, Romeo G., 4,178,335, Cl. 264-8.000.

University of Iowa Research Foundation: *See*—
Lindquist, Everet F., 4,177,994, Cl. 273-176.0FA.

UOP Inc.: *See*—
Antos, George J.; Hayes, John C.; and Mitsche, Roy T., 4,178,268, Cl. 252-439.000.
Johnson, James A.; and Touma, Raouf G., 4,178,230, Cl. 208-66.000.
Tolley, William K., 4,178,176, Cl. 75-101.00R.

Upjohn Company, The: *See*—
Chen, Augustin T.; and Onder, Kemal B., 4,178,432, Cl. 528-340.000.
Kelly, Robert C., 4,178,440, Cl. 542-426.000.
Kelly, Robert C., 4,178,441, Cl. 542-426.000.

Ushikoshi, Kenichi: *See*—
Yamada, Haruyoshi; and Ushikoshi, Kenichi, 4,177,631, Cl. 58-23.0BA.

v. d. Marwitz, Hans-Gunther: *See*—
Muth, Hans-Albrecht; and v. d. Marwitz, Hans-Gunther, 4,178,033, Cl. 296-78.100.

Vaax, Viktor R.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Vache, Marcel, to Application des Gaz. Tapping of gas from a cartridge. 4,177,828, Cl. 137-318.000.

Vahlensieck, Hans-Joachim: *See*—
Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.

Vajarova, Iliyana I.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Valvo, John R.: *See—*
Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., 4,178,489, Cl. 179-100.40C.

van den Berg, Cornelis E. P. V., to Stamicarbon, B.V. Solutions of organic magnesium compounds containing oxygen in hydrocarbons. 4,178,300, Cl. 260-413.000.

Van der Burg, Sjirk, to Uniroyal Aktiengesellschaft. Run - flat tire. 4,177,848, Cl. 152-158.000.

van der Horst, Eberhard, to A. Monforts. Turning machine tool. 4,177,700, Cl. 82-2.00R.

van Geffen, Johannes A., to Technisch Handels- en Adviesbureau van Geffen B.V. Rotatable piercing tools for forming holes surrounded each by a boss in metal plates or the wall of metal tubes. 4,177,659, Cl. 72-71.000.

Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., to Syntex (U.S.A.) Inc. (dl)-16-Phenoxy- and 16-substituted phenoxy-9-keto prostatrienoic acid derivatives and processes for the production thereof. 4,178,457, Cl. 560-53.000.

Van Horn, Maurice H.: *See—*
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.

van Olphen, George C., to Westfalia Separator Aktiengesellschaft. Apparatus for the continuous separation of the flesh of fruit from the pits and skins, especially of the pulp of grapes from their seeds and skins. 4,177,722, Cl. 99-540.000.

van Turnhout, Jan; and Rieke, Johannes C., to N. V. Verto. Method for manufacturing a filter of electrically charged electret fiber material and electret filters obtained according to said method. 4,178,157, Cl. 55-155.000.

Van Wagener, Raymond H.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.

Van Wilson, Marlin; Nickell, Larry C.; and McCormack, John L., to Appalachian Electronic Instruments, Inc. Stop motion system for high speed looms and the like. 4,177,838, Cl. 139-353.000.

Varchei, Mohammed M. N.: *See—*
Daniels, Peter J. L.; and Varchei, Mohammed M. N., 4,178,453, Cl. 548-369.000.

Varian Mat GmbH: *See—*
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.

Vaseen, Vesper A.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,178,357, Cl. 423-522.000.

Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., to W. R. Grace & Co. Synthesis of type Y zeolite. 4,178,352, Cl. 423-329.000.

Vector Engineering Corporation: *See—*
Denney, James H., 4,177,542, Cl. 24-115.00R.

Vedernikov, Nikolai A.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Velasco, Gonzalo: *See—*
Croset, Michel; and Velasco, Gonzalo, 4,178,418, Cl. 429-27.000.

Velsicol Chemical Corporation: *See—*
Albright, James A., 4,178,330, Cl. 525-3.000.

Venaas, Norman B.: *See—*
Hart, David G.; and Venaas, Norman B., 4,177,922, Cl. 235-144.0MA.

Venema, Harry J., to Borg-Warner Corporation. Surge suppression apparatus for compressor-driven system. 4,177,649, Cl. 62-209.000.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Kuttner, Gottfried, 4,178,000, Cl. 277-138.000.

Vermeren, Joseph P., to Acoustic Fiber Sound Systems, Inc. Two-way loudspeaker for vehicle. 4,178,473, Cl. 179-1.0VE.

Vickers Limited: *See—*
Kellett, Harry; and Searle, Harold L., 4,177,887, Cl. 192-8.00R.

Victor Company of Japan, Ltd.: *See—*
Hirota, Akira, 4,178,606, Cl. 358-4.000.

Villa, Alvaro J., to Walt Disney Productions. Three-dimensional animated facial control. 4,177,589, Cl. 40-457.000.

Vinal, Richard S., to Eastman Kodak Company. Copper physical development using heterocyclic ligand copper (I) complexes. 4,178,180, Cl. 96-48.0PD.

Vincent, Ogden W. Long line telephone system with an amplifying substation. 4,178,484, Cl. 179-16.00C.

Vinten, William P., to W. Vinten Limited. Damping mechanisms. 4,177,884, Cl. 188-290.000.

Virtis Company, Inc., The: *See—*
Bird, Harry L., 4,177,577, Cl. 34-92.000.

Viscido, Anthony J.: *See—*
Miller, Alvin L.; and Viscido, Anthony J., 4,177,562, Cl. 433-174.000.

Vishnev, Nikolai V.: *See—*
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V., 4,177,699, Cl. 82-1.00C.

Vlek, Theodorus H. A. M.: *See—*
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.

Vogel, Heinz: *See—*
Weinmann, Gunter; and Vogel, Heinz, 4,177,662, Cl. 72-138.000.

Vogt, B. Richard: *See—*
Wade, Peter C.; and Vogt, B. Richard, 4,178,451, Cl. 546-272.000.

Volk, Lawrence C. Refrigeration system. 4,177,652, Cl. 62-239.000.

Volkamer, Klaus: *See—*
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.

Volkonsky, Boris V.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Voltz, Sterling E.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.

Vondell, Richard M.: *See—*
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, 4,178,392, Cl. 426-96.000.

Von Hagel, Leo, to Maxcap Inc. Blow molded plastic bottle and plastic cap. 4,177,906, Cl. 215-252.000.

Vyzkumny ustav tvarecich stroju a technologie tvareni: *See—*
Kovar, Jan; and Drkal, Jan, 4,177,660, Cl. 72-108.000.

W. Koreska GmbH: *See—*
Koreska, Peter, 4,177,728, Cl. 101-128.200.

W. R. Grace & Co.: *See—*
Fowler, Stephen L., 4,178,220, Cl. 204-159.140.
Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., 4,178,352, Cl. 423-329.000.
Weinberg, Alan S.; and Sun, Joseph Z., 4,178,401, Cl. 428-35.000.

W. Vinten Limited: *See—*
Vinten, William P., 4,177,884, Cl. 188-290.000.

Waddill, Harold G., to Texaco Development Corp. Epoxy resin compositions. 4,178,426, Cl. 528-111.000.

Waddill, Harold G.; and Schulze, Heinz, to Texaco Development Corp. Polyether urea epoxy curing agent. 4,178,427, Cl. 528-124.000.

Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 3-(Substituted hydrazino)benzisothiazole-1,1-dioxides. 4,178,451, Cl. 546-272.000.

Wagener, Dietrich: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.

Wagner, Eugene R.; and Renzi, Alfred A., to Dow Chemical Company, The. Method for treating hyperlipidemia in primates using 4-((4-fluorophenylmethyl)amino)benzoic acid. 4,178,385, Cl. 424-310.000.

Wagner, Remigius. Rod lock for doors or gates having two wings. 4,178,024, Cl. 292-57.000.

Wagner, Ulrich: *See—*
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for measuring the spatial distribution of radiation absorption in a slice of a body. 4,178,510, Cl. 250-445.00T.

Wahl, Georg: *See—*
Kunst, Helmut; and Wahl, Georg, 4,178,244, Cl. 210-71.000.

Wahle, Gunter: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,177,670, Cl. 73-38.000.

Wakasa, Isao: *See—*
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.

Wakatsuka, Hirohisa: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Wakita, Nobuaki; and Hashimoto, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for cleaning exhaust gas for an internal combustion engine. 4,177,641, Cl. 60-278.000.

Walden, Jack M.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Walker, Ford T., to Olin Corporation. Process for the simultaneous production of wet process phosphoric acid and sodium silicofluoride. 4,178,347, Cl. 423-185.000.

Walker, Hazel. Device for teaching concepts of numbers and mathematical principles. 4,177,581, Cl. 35-31.00D.

Walkowiak, Michael: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Wallace, Joseph W.: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.

Wallace, Richard W., to Chromatix, Inc. Light scattering photometer and sample handling system therefor. 4,178,103, Cl. 356-336.000.

Walsh, Edward J.: *See—*
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000.
Walt Disney Productions: *See—*
Villa, Alvaro J., 4,177,589, Cl. 40-457.000.
Waltham, Richard M.: *See—*
Hounsfield, Godfrey N.; and Waltham, Richard M., 4,178,511, Cl. 250-445.00T.
Wanninkhop, Peter: *See—*
Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., 4,177,609, Cl. 51-170.0EB.
Warner-Lambert Company: *See—*
Moorehead, Harvey R., 4,177,809, Cl. 128-214.400.
Schwartz, Charles M.; and Meierhoefer, Eugene J., 4,177,945, Cl. 239-338.000.
Warsaw, Arthur J. Universal shop stand with breakdown feature. 4,177,978, Cl. 269-17.000.
Wasag Chemie AG: *See—*
Oversohl, Wilhelm, 4,178,207, Cl. 162-384.000.
Wasserlein, Henry G., Jr.: *See—*
Fleischhacker, James E.; and Wasserlein, Henry G., Jr., 4,178,055, Cl. 339-98.000.
Wasserman, Harry H.; and Lipshutz, Bruce H., to Research Corporation. β-Lactams, their production, intermediates thereto and derivatives thereof. 4,178,286, Cl. 260-239.00A.
Watabe, Tamon: *See—*
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.
Watanabe, Hideto: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, to Sony Corporation. Speaker system. 4,177,872, Cl. 181-144.000.
Watanabe, Yoshiki: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.
Waterford Ironfounders Limited: *See—*
Marchant, Nicholas G., 4,177,791, Cl. 126-65.000.
Watkins, Kenneth L.: *See—*
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., 4,177,868, Cl. 177-211.000.
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. N-Substituted paramenthane carboxamides. 4,178,459, Cl. 560-125.000.
Watson, Robert E.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Preparation of unsaturated alcohols and intermediates therein. 4,178,297, Cl. 260-346.110.
Wausau Homes, Inc.: *See—*
Brown, William F., 4,178,273, Cl. 260-29.4UA.
Weavers, Mark W.; and Konkler, Anthony W., to Minnesota Mining and Manufacturing Company. Recessed hook and handle for a plastic box. 4,177,896, Cl. 206-387.000.
Webinger, George P., to Champion International Corporation. Container cover with interlocking flap configuration. 4,177,917, Cl. 229-34.0HW.
Webster, Herschel L. Seedling transplanter. 4,177,743, Cl. 111-3.000.
Weed Eater, Inc.: *See—*
Ballas, George C., 4,177,561, Cl. 30-276.000.
Weed, Gehres D., to Altarctic Engineering & Construction Ltd., a part interest. Wind driven power generator. 4,178,126, Cl. 416-17.000.
Wegmuller, Hans: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Wehrmeister, Allen E., to Babcock & Wilcox Co., The. Output control for fluidized bed boilers. 4,177,765, Cl. 122-4.00D.
Weichhand, Robert J., to R. A. Jones & Co. Inc. Apparatus for transferring elongated articles from a single file supply into product buckets of a cartoner. 4,178,120, Cl. 414-41.000.
Weidmann, Erich, to Gebruder Loepfe AG. Electronic weft thread monitor for shuttleless weaving machines. 4,178,590, Cl. 340-677.000.
Weinberg, Alan S.; and Sun, Joseph Z., to W. R. Grace & Co. Packaging film comprising a blended self-welding layer. 4,178,401, Cl. 428-35.000.
Weingarten, Fred. Automatic massaging device. 4,177,804, Cl. 128-52.000.
Weinmann, Gunter; and Vogel, Heinz. Machine for the manufacture of axially prestressed coils from strip. 4,177,662, Cl. 72-138.000.
Weisenborn, Frank L.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,178,291, Cl. 549-39.000.
Weiss, Francis: *See—*
Tellier, Pierre; and Weiss, Francis, 4,178,292, Cl. 260-333.000.
Weiss, Martin J.: *See—*
Schaub, Robert E.; and Weiss, Martin J., 4,178,461, Cl. 562-463.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., 4,178,456, Cl. 560-53.000.
Welch, Montgomery J., to Modular Systems, Inc. Furniture units with concealed fasteners and method therefor. 4,178,047, Cl. 312-140.000.
Weldotron Corporation: *See—*
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., 4,177,622, Cl. 53-511.000.
Welker, Robert H. Sensor positioning apparatus. 4,177,676, Cl. 73-198.000.
Weller, Ronald W.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Weltman, David; and Rivera, Thomas, to O.K. Machine and Tool Corp. Wire-wrapping tool for non-stripped wire. 4,177,555, Cl. 29-751.000.
Wenban, James R.: *See—*
Silver, Alexander; and Wenban, James R., 4,178,046, Cl. 308-9.000.
Wenger, Alfred, to Institut Straumann AG. Device for measuring the density of a fluid. 4,177,669, Cl. 73-32.00A.
Wenninger, Fred, Jr.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Werner, Walter; Herzog, Klaus; and Szenger, Franz, to Carl Zeiss-Stiftung. Measurement head. 4,177,568, Cl. 33-174.00L.
Werstler, Lawrence J.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Wess, Thomas B., to United States of America, Air Force. Apparatus for adjusting and locking a linear actuator. 4,177,681, Cl. 74-110.000.
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., to Dow Chemical Company, The. High strength non-woven fibrous material. 4,178,205, Cl. 162-168.00R.
Western Electric Co., Inc.: *See—*
Ahmed, Nazeer; and Fuchs, Francis J., Jr., 4,177,658, Cl. 72-60.000.
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.
Westfalia Separator Aktiengesellschaft: *See—*
van Olphen, George C., 4,177,722, Cl. 99-540.000.
Westinghouse Electric Corp.: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,178,355, Cl. 423-308.000.
Kappenhagen, George A., 4,177,881, Cl. 187-56.000.
McCarthy, Charles C., 4,178,542, Cl. 324-51.000.
Smith, William J., 4,177,950, Cl. 241-33.000.
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., 4,178,624, Cl. 361-341.000.
Westvaco Corporation: *See—*
Donigian, Doulgas W., 4,177,672, Cl. 73-150.00R.
Wheatland, David A., to Scott Paper Company. Electrophotographic master conversion solution. 4,178,179, Cl. 96-33.000.
Wheeler, Charles W.: *See—*
Marchelletta, Ronald L.; and Wheeler, Charles W., 4,177,781, Cl. 123-146.50A.
White, Allen A.; and Ankenman, Thomas W., to Hesston Corporation. Angularly adjustable mounting for sprocket wheels and the like. 4,177,684, Cl. 74-212.000.
White, James E.: *See—*
Baker, Joseph W.; Cova, Dario R.; and White, James E., 4,178,353, Cl. 423-300.000.
White, Ronald E.: *See—*
Wright, George C.; and White, Ronald E., 4,178,452, Cl. 546-297.000.
White, William J.: *See—*
Merriman, Henry H.; and White, William J., 4,178,015, Cl. 280-711.000.
Whitney, John M.: *See—*
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.
Wichman, William J., to Rain Bird Sprinkler Mfg. Corp. Rotary irrigation sprinkler. 4,177,944, Cl. 239-230.000.
Wiechert, Rudolf: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.
Wienert, Fritz O. Process for dry removal of sulfur dioxide from combustion gases. 4,178,349, Cl. 423-244.000.
Wiher, Wilfried: *See—*
Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., 4,177,713, Cl. 91-375.00R.
Wikstrom International AB: *See—*
Blankenburg, Carl H. T., 4,177,915, Cl. 228-184.000.
Wild, Peter J.: *See—*
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.
Wildbolz, Rudolf: *See—*
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.
Wilkinson Sword Limited: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.
Willey, Robert E., Sr., to Bendix Corporation, The. Integrated antenna aperture. 4,178,581, Cl. 343-108.00M.
William H. Rorer, Inc.: *See—*
Diamond, Julius; and Douglas, George H., 4,178,387, Cl. 424-322.000.

Klein, Robert W.; and Foxx, Mary E., 4,178,373, Cl. 424-233.000.
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., to Merck & Co., Inc. Inhibitors of glycolic acid oxidase. 4,178,386, Cl. 424-317.000.
Williams, Lowell F., to United States of America, Army. Scanning optical spectral analyzer. 4,178,099, Cl. 356-73.000.
Williams, Thomas B.: *See—*
Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., 4,177,822, Cl. 131-17.00R.
Willis, Raymond D.: *See—*
Murphy, Michael P.; and Willis, Raymond D., 4,178,222, Cl. 204-195.00S.
Wilmot-Breeden Limited: *See—*
Jeavons, Philip S.; and Fisher, Sidney E., 4,177,606, Cl. 49-351.000.
Wilson, James A. Flotation recovery of pyrochlore. 4,178,235, Cl. 209-166.000.
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., to Westinghouse Electric Corp. Control center with insulated bus bars. 4,178,624, Cl. 361-341.000.
Wilson, Nicol S.: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Winchell, David A.; and Fowles, Thomas A., to Baxter Travenol Laboratories, Inc. Closure system for containers. 4,177,905, Cl. 215-246.000.
Windmoller & Holscher: *See—*
Achelpohl, Fritz, 4,178,031, Cl. 294-82.00R.
Winn, Ronald R. Display unit. 4,177,902, Cl. 211-162.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., to American Cyanamid Company. Prostenoic acids and esters. 4,178,456, Cl. 560-53.000.
Withoos, Wilhelmus H. C.: *See—*
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.
Woitschatzke, Hans: *See—*
Roth, Walter; and Woitschatzke, Hans, 4,178,012, Cl. 280-609.000.
Wolff, Gerard: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
Wonso, Alex P.: *See—*
James, William L.; and Wonso, Alex P., 4,177,754, Cl. 118-47.000.
Wood, Homer J., to Deere & Company. Single shaft gas turbine engine with radial exhaust diffuser. 4,177,638, Cl. 60-39.51H.
Woodall, Jerry M.: *See—*
Hovel, Harold J.; and Woodall, Jerry M., 4,178,195, Cl. 148-171.000.
Woolard, James M.: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.
Worick, Richard A., to Sunflower Manufacturing Company, Inc. Multi-section implement and drafting structure therefor. 4,178,009, Cl. 280-411.00A.
Wossler, Manfred, to Siemens Aktiengesellschaft. Device for picking up, depositing and transporting thin metal foils by means of a vacuum lifting device. 4,177,983, Cl. 271-268.000.
Woycechowsky, Brain J.: *See—*
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.
Wright, George C.; and White, Ronald E., to Morton-Norwich Products, Inc. Ethyl 3-[(3,4-dimethoxyphenyl)ethylamino]-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate. 4,178,452, Cl. 546-297.000.
Wright, Oscar L.: *See—*
Sullivan, Thomas E.; and Wright, Oscar L., 4,178,241, Cl. 210-24.000.
Wrinn, Joseph F.; and Hoffman, Mark S., to Teradyne, Inc. Analyzing electrical circuit boards. 4,178,543, Cl. 324-64.000.
Wullschleger, Jorg: *See—*
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.
Wurst, John W.; and Dunn, William H., to Singer Company, The. Digital override control of bight and feed in a sewing machine. 4,177,744, Cl. 112-158.00E.
Wurster, Rudolf F.: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Wustefeld, Claus. Method for the manufacture of foamed glass. 4,178,163, Cl. 65-22.000.
Wyckoff, James K.: *See—*
Adams, Ralph D.; and Wyckoff, James K., 4,177,889, Cl. 194-1.00B.
Wynn Oil Company: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,178,134, Cl. 417-181.000.
Xerox Corporation: *See—*
Mrdjen, Peter, 4,178,064, Cl. 350-6.600.
Silverberg, Morton, 4,178,094, Cl. 355-16.000.
Yada, Akio; and Tsukada, Naonobu, to Kabushiki Kaisha Morita Seisakusho. Headrest of treatment table. 4,178,038, Cl. 297-391.000.
Yamada, Haruyoshi; and Ushikoshi, Kenichi, to Kabushiki Kaisha Suwa Seikosha. Small-sized quartz crystal wristwatch. 4,177,631, Cl. 58-23.0BA.
Yamagata, Takaaki: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.
Yamaguchi, Hiroaki: *See—*
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,177,787, Cl. 123-198.00D.
Yamamichi, Masayoshi: *See—*
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with gas evacuating means. 4,178,092, Cl. 355-3.00R.
Yamamoto, Takeshi. Multi-page problem and answer workbook. 4,177,578, Cl. 35-9.00R.
Yamashita, Hisao: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Yamashita, Yoshimasa: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, to Ricoh Company, Ltd. Optomechanical scanning apparatus for copying machine. 4,178,093, Cl. 355-8.000.
Yano, Katsuhiro: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Yarick, Jon R.; and Franks, Nelson J., to Owens-Illinois, Inc. Method and device for assembling coaxially interfitting parts. 4,177,548, Cl. 29-453.000.
Yastrebov, Viktor G.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.
Yasui, Seimei; and Hino, Minoru, to Sumitomo Chemical Company, Limited. Resin for coatings. 4,178,186, Cl. 106-20.000.
Yats, Larry D.: *See—*
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,178,327, Cl. 525-169.000.
Yeargin, G. Scott: *See—*
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.
Yee, Bing S.: *See—*
Frank, Earl E.; and Yee, Bing S., 4,177,837, Cl. 138-31.000.
Yeh, Yu S.: *See—*
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,178,550, Cl. 325-41.000.
Yockey, Francis J.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, to Takasago Thermal Engineering Co., Ltd.; and Nippon Steel Corporation. Apparatus for wet process dehydration of air to be supplied to blast furnace. 4,178,158, Cl. 55-160.000.
Yoshinari, Takashi; and Ookado, Terumi, to Hitachi, Ltd. Ignition system providing sparks for two ignition plugs in each cylinder from a single ignition coil. 4,177,782, Cl. 123-148.00C.
Young, Dale E., II; Elie, David K.; and Schoening, Peter K. Rearing apparatus for fish fry. 4,177,758, Cl. 119-3.000.
Young, John S., to GTE Automatic Electric Laboratories Incorporated. Ring sensing circuit for use with a service evaluation system. 4,178,486, Cl. 179-84.00R.
Yu, Arthur J.: *See—*
Anderson, Donald F.; and Yu, Arthur J., 4,178,423, Cl. 526-240.000.
Yu, Pyung K.: *See—*
Meisinger, Robert H.; and Yu, Pyung K., 4,178,169, Cl. 71-98.000.
Yu, Steve K., to Signetics Corporation. Three state bus driver with protection circuitry. 4,178,620, Cl. 361-98.000.
Zahorecz, Zoltan P. Variable pitch impeller. 4,178,127, Cl. 416-23.000.
Zaweski, Edward F.: *See—*
Papay, Andrew G.; and Zaweski, Edward F., 4,178,258, Cl. 252-32.70E.
Zboralski, Jon A.: *See—*
Grow, Harry N.; and Zboralski, Jon A., 4,177,717, Cl. 98-115.0LH.
Grow, Harry N.; and Zboralski, Jon A., 4,177,718, Cl. 98-115.0LH.
Zeilinger, Karl; and Bachschmid, Reiner, to Daimler-Benz Aktiengesellschaft. Chain drive, especially for the control drive of internal combustion engines. 4,177,689, Cl. 74-242.800.
Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of nitrosobenzene. 4,178,315, Cl. 260-647.000.
Zenzaburo, Iwamoto, to International Business Development Co. Pocket camp stove. 4,177,790, Cl. 126-38.000.
Zerhoch, Horst, to Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG. Pivotable roller frame assembly for a material straightening machine. 4,177,663, Cl. 72-165.000.
Zharnitsky, Anatoly M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Zimmerman, Warren B. Marble game with scoop and cups. 4,177,987, Cl. 273-1.00R.

Zimmermann, Thomas, to F. Zimmermann & Co. Arrangement for counting coins of different diameters. 4,178,502, Cl. 235-92.0CN.

Zinina, Maria A.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Zippel, Herbert, to Herbert Zippel Gmbh & Co. KG. Curved guide for paternoster-type document carriers. 4,178,048, Cl. 312-267.000.

Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,178,296, Cl. 260-343.500.
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100.

Zozulya, Raisa A.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,178,269, Cl. 252-441.000.

Zulliger, Hans R.: *See*—
Dubois, Jaques, deceased; and Zulliger, Hans R., 4,178,513, Cl. 250-491.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbe, Gunter: *See*—
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

AGFA-Gevaert, A.G.: *See*—
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

Cayless, Maurice A.: *See*—
Mason, David R.; Cole, Susan M.; Cayless, Maurice A.; and Wharmby, David O., Re. 30,165, Cl. 313-221.000.

Cole, Susan M.: *See*—
Mason, David R.; Cole, Susan M.; Cayless, Maurice A.; and Wharmby, David O., Re. 30,165, Cl. 313-221.000.

Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, to AGFA-Gevaert, A.G. Exposure system for electrophotographic copying apparatus. Re. 30,164, Cl. 355-69.000.

Ettelbruck, Rudiger: *See*—
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

Honeywell Inc.: *See*—
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ISSUED DECEMBER 11, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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